

SELL-OFF DECISIONS: A STUDY OF SHAREHOLDER WEALTH,  
FINANCIAL RATIOS, AND INFORMATION CONTENT

BY

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Sell-off activities include selling part of a firm's assets (e.g., a segment, a division, etc.) while the firm continues to exist in essentially the same form. This dissertation examines (i) the common stock returns around sell-off announcements, (ii) the effects of sell-offs on measures of the financial health (ratios) of the firm, and (iii) the cross-sectional association between the capital structure changes and stock returns.

The evidence shows that both sellers and buyers earn significant positive excess returns from these transactions. Both the first and second announcements are associated with significant positive excess returns to the sellers. When negotiations are unsuccessful, sellers experience significant negative excess returns. There is also evidence

that sell-off announcements are preceded by a period of significant negative returns for the sellers. There is no difference between the excess returns earned by the firms that have been performing poorly prior to sell-off and the firms that did not fall in this category. The firms that sold profitable units earned the same excess returns in comparison with the firms that sold unprofitable units. Firms selling units to insiders do not earn excess returns around the announcements of such sales.

Except for the debt-equity ratio, other financial ratios of the sell-off firms do not change after sell-offs in comparison with the ratios prior to sell-offs. Cross-sectionally, the results indicate that for poorly performing firms, the market views the sell-off announcements as positive steps in improving the capital structure (debt-equity ratio) of those firms, since the excess returns are associated with the effect of proceeds from the sale on the debt-equity ratio.

## CHAPTER I

### INTRODUCTION

Substantial research has been undertaken in recent years on mergers, acquisitions, tender offers, capital structure changes, and other financial planning topics. This research has considerably expanded our knowledge about the associations of these decisions with the welfare of the stockholders involved in these issues.<sup>1</sup> However, selling parts of a company's assets is another important decision in this area that has not been adequately researched.

This dissertation develops a number of hypotheses related to the sell-off issue and presents empirical evidence with respect to those hypotheses. A sell-off is defined as selling part of a firm's assets (e.g., a segment, a division, etc.) while the firm continues to exist in essentially the same form as that prior to the sell-off. Involuntary (ordered by the Government) sell-offs, leveraged buyouts, liquidations, reorganizations, etc. that result in a substantial change in the corporate ownership structure are not included in the ensuing analysis.

Prior research on sell-offs has been limited. Ellert (1976) examined stockholder returns to firms involved in forced divestitures because of the actions of the Antitrust Division of the Department of

Justice or the Federal Trade Commission. He did not examine voluntary divestitures. Boudreaux (1975) found a positive stock price effect for spin-offs and sell-offs together for up to three months around the event date. He did not distinguish between sell-offs and spin-offs. A spin-off occurs when one firm is divided into two or more parts in such a manner that the current shareholders receive pro-rata distribution of equity claims in all the newly formed firms. There is no cash flow from or to the old firm in a spin-off. On the other hand, a sell-off is defined to be a sale of a unit, and therefore the firm receives cash or its equivalent in return. It is important to analyze sell-offs and spin-offs separately, because spin-offs are known to be associated with stock price increases. Since Boudreaux (1975) did not distinguish between spin-offs and sell-offs, his results could be due to the spin-off sample alone. Also, no statistical tests were performed by him. Alexander et al. (1984) examined a small sample of 53 firms and found no significant (at 5% level of significance) excess returns to the stockholders of the selling firms. Their sample selection procedure appears to be biased towards small sell-offs since they limited their selection to firms with only one sell-off related news item in The Wall Street Journal Index. Also, no study has examined the stock price behavior of the buyers in this transaction.<sup>2</sup>

The rest of the dissertation is organized as follows. Chapter II explains the possible management motives for sell-offs and develops a number of interrelated hypotheses. The main argument behind this analysis is that divesting firms are expected to experience a positive

stock price effect because managers act in the best interest of the stockholders. The information signal to the market is, however, likely to be different in circumstances where the firms have been performing poorly in the recent past compared to the firms that have not been performing poorly. The stock price reaction is therefore examined separately for the poorly performing firms and for the not poorly performing (healthy) firms. Further, it also appears reasonable to argue that the price effect will depend upon whether sell-offs involve the selling of a profitable segment or an unprofitable segment. The first six hypotheses address these different cases. In general, for both (poorly performing and healthy) types of firms, those disposing unprofitable segments are expected to experience larger stock price gain than those selling other segments.

Hypothesis No. 7 relates to a comparison of the financial health (ratios) of divesting firms before and after the event. The next two hypotheses (No. 8 and 9) relate to manager-shareholder conflict and the effects of announcements of difficulties (abandonment, etc.) in sell-off plans, respectively. Hypothesis No. 10 relates to the expected wealth effects on the buyers. Assuming that the buyers also invest in positive net present value projects, their stocks are also expected to experience positive stock price effect.

A cross-sectional hypothesis (No. 11) is then developed to enhance our understanding of the association between capital structure changes and stock returns in the present context. Cross-sectional analyses of the stock returns in merger-related issues and similar

areas are only beginning to emerge. This hypothesis essentially argues that a sell-off announcement is a signal to the market that the firm is taking steps to improve its capital structure. Thus the announcement effects are expected to be associated with the anticipated capital structure changes.

Chapter III presents data collection and other issues relevant to the empirical work. Chapter IV presents the results of the empirical work, which may be summarized as follows. The main finding of the research is that both sellers and buyers earn significant positive excess returns around the first publicly available announcement dates. For the sample of over 1000 initial announcements, the average excess return to the sellers is a statistically significant 0.7%. The buyers also earn statistically significant, albeit smaller (0.34% on day -1), excess returns. For the sellers, the sell-off announcements are preceded by a period of negative excess returns, a significant -10.8% from day -360 to day -11 relative to the first sell-off announcement. There is no significant difference between the excess returns earned by the poorly performing firms and the healthy firms. The firms that sold profitable units earned the same excess returns in comparison with firms that sold unprofitable units. Except for the debt-equity ratio, other financial ratios of the sell-off firms do not change after sell-offs in comparison with the ratios prior to sell-offs. Cross-sectionally, the excess returns are associated with the effect of proceeds from the sale on the debt equity ratio. Chapter V concludes this dissertation.

Notes

1. Numerous studies on merger and related issues find that stockholders of the acquired or the target firms earn "abnormal returns," and these returns are not completely dissipated, even when the proposals are not completed (e.g., Mandelker, 1974; Dodd and Ruback, 1977; Langetieg, 1978; and Dodd, 1980). A recent review of this literature is presented by Jensen and Ruback (1983). Since a large number of merger-related studies exists, no criticism is implied of a study omitted from the references.
2. For a discussion of sell-offs in the popular press, see Welling (1978), Anreder (1980), Adkins (1981), Asset Redeployment (1981), etc. Also see the following first page articles in *The Wall Street Journal*: 11-5-76, 1-3-79, 1-15-79, 6-20-80, and 8-11-81. Alberts and McTaggart (1979) provide guidelines for determining whether a company should divest an existing division. Their analysis is essentially an illustration of the well known net present value approach of evaluating investments.

CHAPTER II  
HYPOTHESES GENERATION  
Literature Review

Prior research on sell-offs has been limited. Along with a review of sell-off studies, this section also draws upon some research from the merger and spin-off literature. Some analogy between mergers and sell-offs is appropriate since sell-offs can be viewed as partial mergers between the sellers and the buyers. In a merger, the entire firm is taken over by the acquirer, whereas in a sell-off, only part of the firm is purchased by the buyer. Sell-offs can also be compared with spin-offs. In a spin-off, a company distributes all the common shares of its subsidiary to the existing shareholders. There is no buyer per se, and there are no direct cash flow implications. However, in both spin-offs and sell-offs, a segment of the company is effectively separated from its existing management. Both decisions could emanate from the parent's desire to specialize in a limited number of business activities.

Ellert (1976) examined the risk and return characteristics of 205 large corporations whose merger activities were challenged by the Antitrust Division of the Department of Justice or the Federal Trade Commission over the period 1950-1972. The impact of the divestiture

program was studied and comparisons were made to the returns realized by stockholders in companies whose merger activities were not challenged by the antitrust law. Ellert did not examine the returns to stockholders engaged in voluntary divestitures. He found no significant effects on the security prices of firms that were forced to divest previously acquired assets.

Boudreaux (1975) used monthly data and found a positive stock price effect for spin-offs and sell-offs together for up to three months before the event date. He did not distinguish between sell-offs and spin-offs, and no statistical tests were performed. Given his methodology, it is also not clear whether the stock price reaction occurred on the days of sell-off and spin-off announcements since the reported effect is a manifestation of how the firms were performing prior to and including the days of the announcements. Since he did not distinguish between sell-offs and spin-offs, it is not known whether the stock-price reaction is associated with both spin-offs and sell-offs or only with spin-offs. It is important to analyze spin-offs and sell-offs separately, because spin-offs are known to be associated with stock-price increases (e.g., Hite and Owers, 1983; Miles and Rosenfeld, 1983; Schipper and Smith, 1983; etc.).

Alexander, Benson, and Kampmeyer (1984) have authored the only published paper that specifically discusses the issue of voluntary sell-offs. They used a sample of 53 sell-offs that were announced in the period 1965-1973. Given that a much larger number of sell-offs occur each year, it is not clear how they selected their rather small

sample. For the event period of day -1 and day 0, the excess returns are not significant at the 5% level of significance. For their reported results from three different methods, significance levels are 0.25, 0.07, and 0.33 (their Table II). Their findings, therefore, suggest that the stock-price reaction to the sell-off announcements is statistically insignificant at the 5% level. The power of the tests for such a small sample (in a research design of this type) is expected to be small. This could have affected their results considerably. Their sample was also restricted to firms' announcement which did not have other sell-off related announcements within nine months of the included announcement date. This biases their sample towards smaller sell-offs since large sell-offs are usually reported in The Wall Street Journal a number of times over an extended period. They also examined the pre-event period up to 30 days prior to the event day. Although the sellers' shareholders earn negative abnormal returns in this period, the levels of statistical significance are 0.10 and 0.22 (for the two tests reported for period day -30 to day -2). In general, the findings of Alexander et al. (1984) do not support a strong price reaction, although the circumstances suggest that their weak findings could be due to their research design.

The merger literature has a larger number of studies, too numerous to review here. Jensen and Ruback (1983) provide an excellent recent survey of this literature. The most important finding of this literature is that corporate takeovers, on average, are associated with positive gains to the target firms. The magnitudes of the gains are

large. Jensen and Ruback (1983, p. 10) conclude that "the estimates of positive abnormal returns to targets of successful tender offers in the month or two surrounding the offer . . . are . . . 29.1%." Similarly, the average percentage gains to the successful mergers and proxy contests are 20% and 8% respectively. The target shareholders in unsuccessful tender offers and mergers, on the other hand, earn about -3%. On average, the gains to the successful "sellers" are large. In contrast, it appears that the bidding firms (the buyers) earn close to zero abnormal returns.

In the pre-event period, the target (sellers) firms, on average, experience negative abnormal returns. Ellert (1976) reported that the sample cumulative abnormal returns for 311 New York Stock Exchange firms which were acquired in 1950-1970 was -11.7% over months -100 to -8. Thus the targets (sellers) are usually those whose performance in the pre-event period has been below average. Similar results are reported by Asquith (1983) and Malatesta (1983). Asquith reported that between day -480 and day -20 successful targets earn -14.1% relative to the event day, and unsuccessful targets earn -10.5%. Malatesta (1983) reported that the acquired firms earned -8.5% from month -24 to month -4. It would be interesting to see if the sellers and buyers in the sell-off sample also exhibit similar stock-price behavior around sell-off announcements.

Spin-offs are also comparable to sell-offs. At least three studies have recently been published in the academic journals. These are Hite and Owers (1983), Miles and Rosenfeld (1983), and Schipper and

Smith (1983). In general, the results are consistent across all the three studies. In the two-day interval surrounding the first press announcement, the firms experienced positive average excess returns of about 3%. In the pre-event period of 120 days, Miles and Rosenfeld reported an average gain of about 20.0%. Similarly, Hite and Owers reported that the median spin-off in the sample was associated with an abnormal return of 7.0% from 50 days prior to the announcement through completion of the spin off. Similar to the merger cases, the announcement effects are large and positive, but there is one important difference between the evidence from the merger studies and the spin-off studies. In the pre-event period, the target firms in the merger studies were found to experience negative abnormal returns, whereas spin-off firms experience positive abnormal returns. This difference between the pre-event period behavior should be useful in indicating which group the sell-off firms are closer to.

#### General Hypothesis

For the entire analysis in this dissertation (except for hypothesis 9), it is assumed that the managers act in the best interest of the stockholders. This assumption appears to be reasonable since most sell-off decisions draw the attention of the media and, therefore, of the stockholders. Also, in many cases, sell-off decisions require the approval of the board of directors and/or stockholders.<sup>1</sup>

A value maximizing firm would engage in a sell-off only if the net present value of that sale is positive. On average, we would therefore

expect a positive stock price effect for the divesting firms around the sell-off announcements, provided that the announcements were not completely anticipated. It is not being suggested that all such announcements would be associated with positive stock price reaction. Many other motivations for sell-offs probably exist that could imply both positive and negative effects on stock prices. For example, other possible reasons for sell-offs could include (i) relaxing regulatory constraints, e.g., by selling a foreign subsidiary or by selling a regulated subsidiary, (ii) renegotiating labor contracts, (iii) improving reported profits for management compensation or other management goals, (iv) manipulating earnings for tax/political reasons, (v) repayment of debt, (vi) avoidance of bankruptcy and other possible defaults on loans, (vii) facilitating mergers, etc. This list of motives is obviously not purported to be exhaustive, but the above arguments suggest that the potential first-order benefits to the shareholders from sell-offs are expected to result in a positive influence on stock prices. This discussion suggests the following testable hypothesis.

Hypothesis 1: Announcements of sell-off plans by firms, on average, result in a positive effect on the stock prices of those firms.

This hypothesis is initially extended to two important scenarios which could lead management to plan sell-offs. These two scenarios relate to firms that have been performing poorly in the periods prior to their sell-off announcements and firms that have not been performing poorly. These are discussed next with some other extensions.

### Firms That Have Been Performing Poorly

Unforeseen circumstances such as poorer than expected earnings and cash flows could create financial problems for a firm. A sequence of unexpectedly poor earnings is likely to cause liquidity problems. For a levered company (the usual case), these unfavorable results increase the probability of default on debt repayment. In these circumstances, the firm will also find it difficult to borrow money at reasonable rates even for new, less risky projects. This is because lenders, in their decisions, will incorporate the effect of existing debt which is riskier than the new debt, and unless some kind of enforceable "me first" rules are used, the interest rate demanded on the new debt will be higher.<sup>2</sup> One method for management to get out of this difficult situation would be to sell-off some of the assets and improve the financial condition of the company. Since the firms are known to have performed poorly, it is assumed that the market has already adjusted the stock prices of these firms for their poor performance. In this scenario, a sell-off is seen as a step in improving the financial health of the company and therefore the stock prices are revalued upwards. This discussion suggests the following testable hypothesis.

- Hypothesis 2: Announcements of sell-off plans by firms in financial trouble are considered by the market as a positive step towards improving their financial structure and in turn result in positive effects on the stock prices of those firms.

The basic argument above is that poorly performing firms dispose assets to improve their financial health. Firms which dispose

unprofitable units are more likely to bring those firms to better financial health than firms that dispose profitable units. This suggests that the sample of poorly performing firms should be divided into two groups: (i) firms disposing of unprofitable units (group A) and (ii) firms disposing of profitable units (group B). This discussion suggests the following testable hypothesis.

Hypothesis 3: Among poorly performing firms, firms disposing unprofitable units (group A) would experience a larger positive stock price effect than firms disposing of profitable units (group B).

#### Firms That Have Not Performed Poorly (Healthy Firms)

The following scenario predicts a positive stock price effect for firms announcing sell-off plans when they are not in financial trouble. Similar to acquisitions, sell-offs can be thought of as outcomes of profit motives (positive net present value projects). In the sell-off case, the situation can be thought of as if management has realized that some of the firm's assets are more valuable to outsiders than to the firm itself. Thus, it would be profitable and in the interest of the stockholders to sell such assets. Note that it is less likely that outsiders will be aware that only a part (rather than the whole) of some other firm is a valuable asset. It is not surprising then that the sale of a portion of the assets (and not an entire company) appears to be initiated more often by the owners. Hence, the sell-offs by these firms may be viewed as recognition of profit opportunities.<sup>3</sup>

Hypothesis 4: Announcements of sell-off plans by healthy firms (for reasons of profit opportunities) are expected to result in a positive effect on the stock prices of those firms.

Among this group of healthy firms, those selling unprofitable units would improve their financial health relatively more than those selling profitable units. To the extent this improved situation allows them to take advantage of possible alternative (new) opportunities, firms selling unprofitable units are expected to perform better than firms selling profitable units. This analysis suggests the following testable hypothesis.

Hypothesis 5: Among healthy firms, those disposing unprofitable units (group C) would experience a larger positive stock price effect than those disposing profitable units (group D).

As outlined above, the main motive behind the sell-offs by the poorly performing firms is to improve their capital structure, whereas healthy firms are motivated by profit opportunities. These are two different types of information signals. Although a directional hypothesis is difficult to obtain, further insight into the possible differential stock-price reaction to announcements by these two main groups can be obtained by an empirical examination. If the importance of one type of signal to the market is larger than the importance of the other type, the market is expected to react differentially for the two. This discussion suggests the following testable (null) hypothesis.

Hypothesis 6: For the set of firms disposing assets, the positive stock price effect experienced by the healthy firms (groups C and D) is

the same as that experienced by the poorly performing firms (groups A and B).

#### Additional Hypotheses for Sellers

Three more hypotheses for sellers are developed in this section. This extension is expected to provide additional complementary information on the previous hypotheses.

Financial ratios before and after sell-offs. Financial analysts and other participants in the market are known to concentrate on various financial ratios in assessing the value of the firm. This behavior is not contradictory to the implications of the efficient market hypothesis, because financial ratios are useful in assessing the riskiness and, therefore, the value of the firm's securities. For examples of this viewpoint, see Beaver, Kettler, and Scholes (1970) and Elgers (1980). Also, a number of studies indicate that financial distress predictions and credit decisions can be improved with a judicious study of financial ratios. For examples, see Beaver (1966), Deakin (1972), Abdel-Khalik (1973), Altman (1976), Ohlson (1980), and other references in these papers. Hence, it appears reasonable to assume that corporate managements like to present the best possible picture of their firms. The achievement and maintenance of "good" ratios is therefore a desirable goal. Some financial ratios can be improved by sell-offs. For example, the net income to total assets ratio can be improved by selling those units which either have losses

or relatively poor (in comparison with other units of the firm) earnings.

Whether sell-offs affect (and hence possibly were undertaken to improve) firms' financial ratios can be studied by examining the ratios before and after the sell-offs. This proposition is complementary to the earlier argument that firms in financial trouble are likely to engage in sell-offs. In this respect, examining the financial ratios is another way of understanding the motives behind the sell-offs. The above discussion leads to the following testable hypothesis.

Hypothesis 7: Firms engaging in sell-offs show an improvement in their financial ratios after the sell-offs in relation to their pre-sell-off ratios.

Whereas this hypothesis is not stated specifically for the group of firms in financial trouble, it appears that firms in financial trouble would provide a more powerful test of this hypothesis. The hypothesis therefore will be tested separately for the firms in financial trouble and those not in trouble.

~ Impediments in sell-off plans. Some firms abandon or postpone sell-off plans because of difficulties in negotiations, government interference, etc. This implies that the market's expectations associated with earlier announcements of the sell-offs are not realized. Given the earlier positive stock price effect, it is expected that such announcements will be associated with a negative stock price effect. This discussion suggests the following testable hypothesis.

Hypothesis 8: Firms abandoning (or confronting other difficulties in) previously announced sell-off plans experience a negative stock price effect around such announcements.

Manager-shareholder conflict. Some sell-offs involve the sale of units to existing managers. Such managers are privy to information about the firm's plans to sell segments and also knowledge of individual segment performance. Further, their managerial role enables them to influence sell-off decisions. The existing managers (or other insiders) would therefore be able to buy a segment that could have been sold to outsiders at a higher price. Selling to the insiders under this scenario could be viewed as a signal to the market that such sell-offs are less advantageous to the firms compared with sell-offs made to outsiders. This discussion suggests the following testable hypothesis.

Hypothesis 9: Firms disposing units to insiders experience a smaller stock price effect than the firms disposing units to unrelated parties.

All the above hypotheses essentially examine the time-series properties of various firm specific variables for the sellers. The focus of the dissertation is not on the buyers per se, but some additional complementary information can be obtained by examining the stock prices of the buyers as well.

### Implications for Buyers

Earlier it was argued that sell-offs could be viewed as partial mergers. Under this scenario, the stock price effect on buyers would be similar to that experienced by the bidders in the merger related studies. Numerous merger-related studies have examined the effects of takeovers on bidders' stock prices around the time of announcement of merger attempts. Although results vary somewhat across studies, on the whole, the returns to the bidders (i.e., the buyers) are essentially zero. The two to three day announcement effect (i.e., the day before, the day of announcement, and the day after) is significantly negative in Dodd (1980), but positive and insignificant in Asquith (1983) and Eckbo (1983). Jensen and Ruback (1983, p. 16) summarize these and other studies and conclude that "the estimated abnormal returns to successful bidding firms in all six studies . . . suggest that mergers are zero net present value investments for bidders . . . except for the Dodd estimates." This result is consistent with the argument that the acquisition market is perfectly competitive.<sup>4</sup> In the market where a large number of potential buyers exist, all the gains from the expected synergy will accrue to the holders of the unique assets; i.e., the sellers earn positive excess returns, whereas the buyers earn zero excess returns.<sup>5</sup> Ruback (1983) discusses this issue in greater detail and presents results that suggest a competitive acquisition market.

However, sell-offs involve selling assets that are not traded publicly, these transactions take place in a relatively less

competitive environment than the merger environment. In the merger environment, when the bidder company announces a plan to take over another company, other possible acquirers in the market can also analyze the situation and make counter offers, leading to competitive bidding. Most sell-off activities do not follow this sequence of events. Negotiations are usually private, and the results are not announced until the transactions are almost complete. Therefore, the buyers in sell-off cases are relatively more likely to earn positive excess returns than their counterparts in the merger cases. The sell-off announcements are therefore expected to be associated with a positive influence on the stock prices of the buyers as well. This discussion suggests the following hypothesis.

Hypothesis 10: Announcements of purchase of units (being sold by other firms) result in a positive effect on the stock prices of the buyers.

All of the above hypotheses seek to test the time series characteristics of stock returns and financial ratios. Cross-sectional examination of stock returns in merger related literature is only just beginning to emerge. For examples of cross-sectional analysis, see Masulis (1983) and Asquith, Bruner, and Mullins (1983). The usual form of cross-sectional analysis is to explain the excess returns as a function of some firm specific variables (such as debt-equity ratios, etc.).

The next section proposes to examine a cross-sectional association between the risk-adjusted stock returns and changes in capital

structures (and other possible appropriate measures of firms' financial health, such as the probability of bankruptcy) of the firms.

### Cross-sectional Analysis

The following analysis assumes that an optimal capital structure exists for each firm at all times. There is voluminous literature on this topic, and no definitive answers have emerged. A brief summary of the present state of the art and the relevant references can be found in Modigliani (1982).<sup>6</sup> This assumption does not imply that the actual optimal value is known. It may only be a range which the management attempts to achieve. Empirically, the assumption of an optimal capital structure seems to be reasonable in that different industries are known to have somewhat different debt-equity ratios. The main motivation of this assumption in the present context is that it implies that when a firm deviates from the optimal capital structure, the management will take steps to bring the firm back to its optimal capital structure. The following analysis is in part motivated by Masulis (1983), where he examined the cross-sectional distribution of excess returns to shareholders associated with the announcement of issuer exchange offers. Mikkelsen (1983) also presented an analysis similar to Masulis (1983).<sup>7</sup>

It was argued earlier that sell-offs by financially troubled firms can be viewed as positive steps by management to improve the firm's capital structure. In this respect, sell-offs are signals to the

market that management is taking steps to improve the firm's capital structure. There are two aspects of sell-offs that could affect stock prices: (a) the effect of the proceeds from the sell-offs used to improve the debt-equity ratio, and (b) the signal conveyed by sell-offs that the firm is taking other steps for making the debt-equity ratio optimal. Let

$DE_{1i}$  = Debt-equity ratio of firm  $i$  before a sell-off,

$DE_{2i}$  = Debt-equity ratio of firm  $i$  after adjusting  $DE_{1i}$   
exactly for the proceeds from the sell-off (this is a  
hypothetical number), and

$DE_{3i}$  = Optimal debt-equity ratio for firm  $i$ . (Two possible  
proxies for  $DE_{3i}$  are the industry debt-equity ratio and  
the actual debt-equity ratio of the firm after the  
implementation of the sell-off plans.)

From (a) above, it is expected that the excess return would be a function of  $(DE_{1i} - DE_{2i})$  and from (b), excess return would be a function of  $(DE_{1i} - DE_{3i})$ . This analysis suggests the following cross-sectional regression.

$$ER_i = a + b_1 (DE_{1i} - DE_{2i}) + b_2 (DE_{1i} - DE_{3i}) + u_i$$

where

$ER_i$  = Excess return for firm  $i$  around the sell-off  
announcements,

$u_i$  = a random term.

The above discussion is presented in terms of debt-equity ratio (capital structure) but the sell-offs can alternatively be thought of

as representing signals that firms are taking steps to improve the general health and reduce the probability of default. To examine this, in the above regressions, the independent variables could be replaced by a comprehensive measure that captures the probability of default (defined in detail in the next chapter on research methodology). This discussion suggests the following testable hypothesis.

Hypothesis 11: For the poorly performing firms, the coefficients  $b_1$  and  $b_2$  are expected to be positive, whereas for other healthy firms, these coefficients are expected to be insignificantly different from zero.

For the poorly performing firms, statistically significant positive values of  $b_1$  and  $b_2$  are consistent with the above analysis. If only  $b_1$  is as predicted, it would indicate that the market adjusts only according to the effects of sell-offs on the debt-equity ratio. If only  $b_2$  is significant, it would indicate that the magnitude of sell-offs are important in that they signal other steps by management toward improving the capital structure of the firm. Given the above arguments,  $b_1$  and  $b_2$  are expected to be zero for the healthy firms. The final outcome is, of course, an empirical question. In particular,  $b_1$  captures the effect of the magnitude of sale. If stock market reaction is associated with the size of sell-offs,  $b_1$  is expected to be positive for both the poorly performing firms as well as for the healthy firms.

### Notes

1. A large number (over 500) of reports (news items) in The Wall Street Journal was also read to understand the stated reasons in sell-offs. In most cases, the companies either decline to give reasons or state a catch-all reason, such as strategic planning or improve stock price, etc.
2. Fama and Miller (1972, pp. 167-170) discuss the importance of completely protective covenants or "me first rules," and they demonstrate that under completely protective covenants, the values of a firm's individual securities are invariant to capital structure changes. In this respect, if a new loan can be "completely protected" by a collateral, the existing financial problems will not affect the interest rates demanded by the lender.
3. The underlying management motivations for many financial planning decisions are not well understood. For instance, both the sell-offs and spin-offs can emanate from the desire to achieve the same goal: allowing the parent to specialize in fewer business activities. As a representative example of statements by the sellers, Union Carbide, while announcing (The Wall Street Journal, 10-29-79) the possible sale of its metal working chemicals business, stated, "recent strategic planning studies have concluded that metal working chemicals business doesn't fit into the corporation's business portfolio and long range plans."
4. Asquith, Bruner, and Mullins (1983), on the other hand, argue that the studies examining the returns to bidders do not control for many important factors, such as the time period in which the bid occurs, the target size, and the success of the merger bid. The insignificant results may be because of the reason that these additional controls are not used.
5. Strictly speaking, the successful acquirer earns the difference between the expected benefits on the acquisition (or merger) less the expected benefits to the second best offerer. In a perfectly competitive market, it would diminish to zero.
6. Modigliani and Miller's (1958) proposition states that in a world with no transaction costs, no taxes, and perfect markets, the market value of any firm is independent of its capital structure. This proposition has been elaborated in Fama and Miller (1972). Inclusion of taxes and bankruptcy costs usually makes the capital structure important. Two other important lines of research which have argued that capital structure is important include the incentive signalling approach of Ross (1977) and the agency theory

approach of Jensen and Meckling (1976). In the incentive signalling approach, a financial structure signals information to the market. Leland and Pyle (1977) also argue that moral hazard prevents direct information transfer. The willingness to invest may serve as a signal to the lending market. In the agency framework, an optimal capital structure obtains where the total agency costs (arising from stockholder-bondholder conflicts) are minimized.

7. In a somewhat different, although related context, cross-sectional analysis is also performed by Collins, Rozeff, and Dhaliwal (1981), Holthausen (1981), and Leftwich (1981), etc. In this literature, the main objective is to cross-sectionally explain the abnormal returns as a function of agency cost variables. Holthausen and Leftwich (1983) provide a summary of this literature.

CHAPTER III  
RESEARCH METHODOLOGY  
Data Collection

The starting point for the data collection process is the Mergers and Acquisitions Journal. This journal publishes a list of recent sell-offs. From the 1977-78 issues of the journal a list of firms was obtained that met at least one of the following criteria:

- (1) The sale of the unit of the firm was for \$10 million or more.
- (2) The sale was reported in the M & A Journal as a large sell-off (implicitly/explicitly with respect to firm size) even if it was for less than \$10 million.
- (3) The sale was reported to be a large sell-off and no reference was made to dollar amount.
- (4) A company makes an announcement of a sell-off plan although no sales have yet been made. (Specific announcements are usually made for large sell-offs only.)

The firms from this list were examined in The Wall Street Journal Index to pinpoint the dates of news items related to the sell-offs. The procedure can be explained more easily by an example. Consider the case of General Mills, Inc. (GMI, henceforth). It has the following three news items in the 1978 WSJ Index.

- (1) Signed letter of intent with Carter-Wallace, Inc., for sale of General Mills O-Cel-O division to Carter-Wallace. 6/14/78
- (2) Plans for sale of firm's O-Cel-O division to Carter-Wallace, Inc., were ended. 8/29/78

- (3) Agreed to sell Smith's Food Group in Britain to Associated Biscuit Manufacturers for \$30 million. 12/14/78

Since the objective was to obtain all the sell-off related news items, including the initial public announcements, the WSJ Index for this firm was also examined for years 1977 and 1979. The 1979 Index does not have any sell-off related news item for GMI, and therefore the 1980 Index for GMI was not examined.<sup>1</sup> The 1977 Index has two more divestiture related news items:

- (1) Approved letter of intent calling for sale of a subsidiary, General Mills Chemicals, Inc., to Menkel KGAA., a Greenman household-care products company, for \$75 million. 4/26/77
- (2) Completed sale of its General Mills Chemicals, Inc., unit to Menkel KGAA., a household-products company headquartered in Dusseldorf, West Germany. 9/2/77

The 1976 Index does not contain any sell-off related news item for GMI. The 1975 Index was therefore not examined. In all, the data collection process thus yielded five news items for GMI. The dates in chronological order are as follows:

- (1) 4-26-77
- (2) 9-02-77
- (3) 6-14-78
- (4) 8-29-78 (-1)
- (5) 12-14-78

These are designated as news item dates. The remark (-1) indicates that it was a "negative news" in the sense that the sell-off plan was abandoned or encountering trouble. This coding is useful for testing hypothesis 8. For each news item date (e.g., the five separate dates for GMI), two additional dates are collected from the WSJ Index: (i) Pre-date and (ii) Post-date. The definitions are as follows:

Pre-date. It is the (nearest) date prior to the sell-off related date on which the WSJ reports an important event for the company (merger, acquisition, takeover, proxy fight, another divestiture, earnings announcement, dividend increase, stock split, spin-off, etc.).

Post-date. It is the (nearest) date subsequent to the sell-off related date on which the WSJ reports an important event for the company. The main objective behind collecting pre- and post-dates is to be able to examine and control the possible influence of the confounding events. Some descriptive statistics on these dates are presented in Table 1.

For each selling firm, an event is defined as the sale of one or more divisions, segments, etc. which is treated as a separate sale by the selling company. Thus a company could have more than one event. For example, GMI sold three divisions (O-Cel-O division to Carter-Wallace, Smith's Food Group to Associated Biscuits Manufacturers, and its chemicals subsidiary to Menkel) during 1977-78. These three sales are identified as three events for GMI. When the selling firm identifies the sale of more than one segment as one sell-off plan, then those news items form part of one event. In the above example, if GMI had announced a comprehensive plan to sell three segments, then GMI would have only one event. It is possible that there is essentially one unannounced underlying reason for the sale of all the segments of the company. However, it is not possible for outsiders to discover that unless the firm reveals a comprehensive plan. Whenever relevant, results will also be reported under the

assumption that all sell-off related news items for a firm are the results of one plan.

For the events thus identified, all the news items are recorded. The first report on each event is used as a proxy for the date when the information about the sell-off first becomes public. It is designated as the "first (announcement) date." When a report indicates that negotiations have been abandoned, the date is designated as "abandonment date." In most cases, firms do not disclose reasons for abandonment. There can be more than one abandonment date for an event. This usually occurs when a firm first announces that negotiations are likely to be unsuccessful, and subsequently it confirms that negotiations have failed. Both these dates are designated as abandonment dates. All other dates (i.e., reports representing successful completion of talks or other favorable announcements) for the event are termed as "second date." To summarize, in this research design, a firm can have a number of events. Each event however has a unique first date, but it can have zero, one, or more than one second date.

The first date for the seller need not be the first date for the buyer. The first date for the buyer occurs when the possible buyer is first identified in the WSJ/WSJI. In many cases, the report indicates that negotiations for the sale of a segment are in progress, but the potential buyer is not disclosed. In these circumstances, the buyer is usually disclosed in a subsequent news item. When a buyer is dropped and another replaces the first one, the first date for the second buyer is the date when the second buyer's name is first reported.

A number of screens are applied to the data. First, stock-returns must be available on the daily CRSP (Center for Research in Security Prices of the University of Chicago) excess returns tape. Second, the sales must involve sale of operating assets; i.e., sales of marketable securities are not included. Third, the sales must not be associated with bankruptcy/liquidation. Fourth, the sales must be voluntary, i.e., not ordered by the government. And finally, the sale must not be a subsidiary-parent transaction.

Table 1 presents a summary of the number of sellers and buyers before the data were checked for the availability of returns on the CRSP tape. In all, there were 1754 news items (dates) for the sellers. These dates came from 328 firms which engaged in the selling of 1107 segments (defined as events). Similarly, 262 separate buyers with 328 events and 547 news items were identified. These numbers reflect the maximums in that the ensuing analysis has a somewhat smaller sample because of missing returns on the CRSP tape.

#### Independent Variable Measurement

##### Poorly Performing Firms and Healthy Firms

Given the hypotheses 2 to 6 earlier, all the firms in the sample need to be categorized either as poorly performing firms or healthy firms. For this purpose, the firms were ranked (classified) according to their performance in the year prior to their first sell-off date. For example, for GMI, the year 1976 would be the year of analysis. The

following two performance criteria were used for ranking the sample of firms.

Stock price performance in the prior year. For all the firms in the sample, the cumulative excess returns (explained in detail later on) for the year prior to the first sell-off related announcement is one basis for ranking the firms. This is a continuous measure of the firms' performances in that each firm has a unique cumulative excess return. This continuous measure can, however, be converted to an interval (group) measure for portfolio level analysis. The main advantage of the portfolio level analysis compared to the analysis at the individual security level is that the variance around the mean portfolio return is reduced substantially. This increases the power of the test. For a description of the portfolio formation technique and the associated advantage, see Fama (1976). In accounting contexts, Abdel-Khalik and Ajinkya (1979) and Foster (1978) provide a detailed description. The firms with the smallest (lowest one-third or so) cumulative excess returns are designated as poorly performing firms, the middle group is discarded from the sample, and the top group is designated as firms performing well.

Financial statement information. Accounting research, particularly studies in the bankruptcy area, has identified a number of firm specific variables which are "good" indicators of firms in financial trouble. Specifically, these studies analyze a number of accounting ratios to identify the ones that are the best predictors of bankruptcy. It appears reasonable to assume that these ratios are also

good indicators of general financial health or conversely "financial trouble" faced by firms. The most appropriate model for the present study appears to be that of Ohlson (1980). In his model, an estimate of the probability of bankruptcy of a firm is calculated on the basis of various accounting variables. In the present context, the objective is not to predict bankruptcy per se but only to relatively rank the firms in the sample from the perspective of their degree of financial health. From the model presented below, it is possible to estimate the probability of bankruptcy for all the firms in the sample. Ohlson's model of estimating the probability of bankruptcy (an inverse measure of financial health) for a firm is given by the following equation:

$$\text{Prob} = 0.407(\text{SIZE}) + 6.03(\text{TLTA}) - 1.43(\text{WCTA}) + 0.0757(\text{CLCA}) - 2.37(\text{NITA}) - 1.83(\text{FUTL}) + 0.285(\text{INTWO}) - 1.72(\text{ONENEG}) - 5.21(\text{CHIN}) - 1.32$$

where SIZE = log (total assets/GNP price-level index)

TLTA = Total liabilities divided by total assets

WCTA = Working capital divided by total assets

CLCA = Current liabilities divided by current assets

ONENEG = One if total liabilities exceeds total assets, zero otherwise

NITA = Net income divided by total assets

FUTL = Funds provided by operations divided by total liabilities

INTWO = One if net income was negative for the last two years, zero otherwise

CHIN =  $(NI_t - NI_{t-1}) / (|NI_t| + |NI_{t-1}|)$

Two methodological issues are worth mentioning from the standpoint of reducing the misclassification of firms. First, given the probability of bankruptcy measure, it is necessary to select a cutoff point above which the firms are considered to be in financial trouble compared to the rest of the firms in the sample. Unless the probability measures from Ohlson's model clearly indicate a bimodal

distribution of the firms, some arbitrary divisors must be chosen. For this purpose, the sample can be divided into three groups. The firms in the two extreme groups can be categorized as poorly performing firms and healthy firms. The middle third of the sample can be ignored. Second, the classification of firms can also be improved by selecting the intersection from the two sets of firms which are classified to be in financial trouble from the two criteria above. It is expected that these steps would reduce the number of misclassifications to a satisfactory level. Note that the probability of default variable is used initially to group firms according to poorly performing and healthy firms (to test hypotheses 2 to 6). It is also used as an independent variable in the cross-sectional test (hypothesis 11).

#### Profitability of the Assets Being Sold

It is important (for testing hypotheses 3 and 5) to identify whether the assets (segments) being sold have been profitable to the selling firm or not. The main source of this information is the Compustat file. The Compustat file reports "discontinued operations" as a separate single data item which includes (i.e., the sum of) two important dollar amounts: (a) income from operations of the discontinued division (segment) and (b) gain/loss on the disposal of the division. This number on Compustat is taken from the company reports. It seems reasonable to assume that assets being sold are depreciated considerably and would be sold at a gain; i.e., item b can

be assumed to be generally positive. Therefore, if the reported amount (i.e.,  $a+b$ ) is a loss, it is reasonably certain that the discontinued operations were incurring a loss (i.e., item  $a$  is negative). The Compustat firms with negative dollar amounts for discontinued operations are therefore identified as loss making segments. To increase confidence in this classification, firms with small negative values for discontinued operations are excluded from the sample for testing purposes.

When a firm sells more than one identifiable segment, it seems unlikely that we can find out whether the segments are separately profitable or unprofitable, since all discontinued operations are grouped together for financial reporting. For instance, in the above example, GMI sold three segments of the company (Viz., O-Cel-O division, Smith's food group, and General Mills Chemicals, Inc.). The basic idea of grouping firms as those selling a profitable or an unprofitable segment is preserved if the sale of three segments is treated as one sell-off plan. Further, this methodology is justified to the extent that identification of different assets of the company into segments or divisions is more or less arbitrary.

In effect, the firms are divided into four portfolios.

1. Firms performing poorly:

- a. Group A: Firms selling unprofitable units.
- b. Group B: Firms selling profitable units.

2. Firms not performing poorly:

- a. Group C: Firms selling unprofitable units.
- b. Group D: Firms selling profitable units.

### Dependent Variable Measurement

This study uses the common stock returns available on the daily CRSP excess returns tape of the University of Chicago. The daily excess return for a security is calculated as

$$ER_{id} = R_{id} - E(R_{id})$$

where

$d$  = day measured relative to a news item,

$ER_{id}$  = excess return on security  $i$  for day  $d$ ,

$R_{id}$  = actual return on security  $i$  for day  $d$ , and

$E(R_{id})$  = expected rate of return on security  $i$  for day  $d$ .

The  $E(R_{id})$  is calculated by grouping all the NYSE and the ASE securities into ten control portfolios according to their estimated betas or estimated standard deviations. The results presented in this paper use the beta controlled portfolios.<sup>2</sup>

Average (across firms) excess returns for each relative day  $d$  are calculated as

$$AER_d = \frac{1}{M} \left( \sum_{i=1}^M ER_{id} \right)$$

where  $M$  is the number of securities for day  $d$ . Daily cumulative average excess returns, CAERs, are the sums of the average excess returns over event time, i.e., CAER for the period from  $d=a$  until  $d=b$ ,

$$CAER_{ab} = \sum_{d=a}^b AER_d$$

The results presented in various tables of Chapter IV have been analyzed using several different methodologies. The qualitative conclusions reached from these methods are generally the same, although test statistics differ somewhat across methodologies. In most cases, the results are presented only from one method. For analyzing the excess returns at the portfolio level, the following approach is adopted.

Portfolios of firms in the sample (buyers or sellers, as the case may be) are formed in event time.<sup>3</sup> Day zero is defined as the date of the publication of the news in The Wall Street Journal. Two types of dependence across returns have been considered. First, several firms may have the same event date, which could lead to cross-sectional dependence in excess returns. To eliminate this dependence, the firms with the same event date are formed into equally weighted portfolios and considered as one security. The second problem relates to the estimation of the standard deviation of the portfolio excess return. Usually, the standard deviation of the portfolio is estimated from an estimation period in which the portfolio has the same securities as in the event period. However, in the present sample, the same firm may have more than one event date, and hence the time series of returns in the estimation period (for estimating standard deviation of the mean portfolio return) may not be independent. To eliminate this problem, only one estimation period for each firm is used, and a firm is weighted according to the number of events for that firm. The estimation period for the results presented is from relative day -480

to day -361 from the earliest event date for that firm.<sup>4</sup> As a further precaution, the first order auto-correlation in this portfolio (day -480 to -361) was examined and was found to differ insignificantly from zero.<sup>5</sup>

A t-statistic which tests whether the average excess return of the portfolio for day d ( $AER_d$ ) is significantly different from zero is calculated by

$$t_d = AER_d / S_d$$

where  $S_d$  is the estimated standard deviation of AERs calculated from the portfolio of the firms in the sample for day -480 to day -361 relative to the first event date for each firm. Similarly, the t-statistic for  $CAER_{ab}$  for a period N days from day a to day b is calculated by

$$t_{ab} = CAER_{ab} / S_{ab}$$

where  $S_{ab}$  is the estimated standard deviation of  $CAER_{ab}$  calculated from dividing  $S_d$  by the square root of N. Some additional description of data and statistical procedures is presented along with the results. The next chapter presents the results of the empirical analysis.

Notes

1. Initially, for about one-third of the sample, the WSJ Index was examined until two calendar years on either side were without sell-off related news. But it soon became apparent that sell-offs for a firm take place in clusters. Thus, the search was limited until one calendar year on either side was found without any sell-off related news.
2. The method used for estimating the market model parameters (alphas and betas) for calculating excess returns was developed by Scholes and Williams (1977). The excess returns tape became available to us only recently. Prior to that, for some of the analysis, one factor market model described in Fama (1976) and mean adjusted returns described in Brown and Warner (1980) were used. No appreciable differences in results were noticed in switching to the excess returns tape.
3. For days of missing returns in the estimation periods, two methods were attempted with identical results. First, the missing returns were replaced by the mean of the portfolio returns, and second, the replacement was an estimated mean return of the same firm from the prior 60 days. The results reported use the former approach. When a security has a missing return for day  $d$ , the reported CRSP file return for  $d+1$  is effectively a two day return. To overcome this problem, the return for day  $d+1$  was also not included in the analysis. Similar adjustments were also made for missing returns for more than one day.
4. The main reason for going as far back as 360 days is that sell-off firms are found to be performing poorly in the period immediately prior to the sell-off announcements. As a further precaution, another estimation period (from day  $+61$  to day  $+120$ ) was used for much of the results. The post-period estimation period also resulted in similar results.
5. The significance test for the first order autocorrelation is based on the following method. The expected value of the  $t$ -order autocorrelation is  $-1/(T-t)$  and the variance is  $1/(T-t)$  where  $T$  is the number of observations in the sample (120 in the present case). For a further description, see Fama (1976, p. 118).

Table 1

Summary of Events and News Items for Sellers and Buyers Engaged  
in Sell-off Activities

	Sellers	Buyers
A. No. of firms (CRSP firms)	328	262
B. No. of events for these firms	1107	328
C. No. of all news items for firms in the sample	1754	547
D. Breakup of news items		
i) First announcements	1107	328
ii) Second announcements (successful sales)	514	170
iii) Abandonment announcements (unsuccessful sales)	133	49
E. Average number of news items per firm	5.3	2.1
Standard deviation	5.8	1.7
F. Average number of events per firm	3.4	1.3
Standard Deviation	3.8	0.6
G. Average number of days between the predate and the news-item date	21.1	n.a.
Standard Deviation	20.7	n.a.
H. Average number of days between the news-item date and the post-date	20.2	n.a.
Standard Deviation	25.1	n.a.

## CHAPTER IV

### EMPIRICAL ANALYSIS

#### Results

In this chapter, the empirical results are presented for the eleven hypotheses developed in Chapter II. Most of the results are presented in the sequence of the hypotheses. For testing hypotheses 2 to 6, the results are initially presented at the portfolio level, but at the end of hypothesis 6 results, additional complementary results are presented which use a cross-sectional regression approach. Some additional appropriate analysis is also presented along with the main results.

#### Hypothesis 1

To evaluate the stock market's response to an event, excess returns need to be examined for times during which the probability of the event outcome changes. The most important date to capture the effect of an announcement is the first public announcement. The market is expected to react in an unbiased manner to the announcement of the news. If the announcement is good news, the excess returns will be positive, and if the announcement is bad news, the excess returns will be negative. To reduce the noise component, such analysis should,

however, best be performed at the portfolio level. Various ensuing tables present results at the portfolio level.

First announcement date for sellers. Table 2 presents the cumulative average excess returns from day -120 to day +120, where day zero is the first publication date in The Wall Street Journal. For day -1 and day -2, the sellers earn significant positive excess returns. The  $t$ -statistics for these days are 5.95 and 2.15 respectively, which are statistically significant at conventional levels of significance. For the period day -5 to day -1, the first announcement is associated with an excess return of 0.7%, which is also statistically significant ( $t$ -statistic of 4.04).

For a much smaller sample of 53 firms, Alexander et al. (1984) find positive but insignificant results at the 5% significance level. The present sample is approximately 20 times larger than their sample, which allows us to examine the stock-price reaction with increased power for the test statistic. Secondly, their sample selection procedure eliminated all firms with more than one sell-off related news item. This biases their sample towards smaller sell-offs since large sell-offs are generally reported in The Wall Street Journal a number of times over an extended period. These two important differences could lead to the insignificant results of Alexander et al. (1984).

In absolute percentage terms, the comparison with merger related studies indicates that the excess returns to sell-off activities are much smaller than those earned by the target firms in mergers. For example, Asquith (1983) reports excess returns to the target firms of

about 7% for day -1 and day 0 around the first announcement date. This difference in the level of impact may reflect the relative importance of these two types of events.

Since one firm can have two or more event dates adjacent to one another, all the event dates (for the same firm) that were within 5 days of one another are not included in the analysis.<sup>2</sup> Thus the 6-day period (day -5 to day0) does not have time series dependence. The longer periods could, however, have some dependence across time. Subject to this limitation, the results in panel B of Table 2 suggest that these firms on average were poor performers in the pre-sell-off period for a period extending at least 120 days before the event date. The t-statistic for day -120 to day -11 is -4.54. An improved analysis confirming this observation is presented below. It is also noticed that the CAERs for periods after the event date are essentially zero. This evidence is consistent with the hypothesis that the market is efficient in a semi-strong sense with respect to this particular event. It also increases confidence in the various test statistics presented. If the test statistic is not specified properly, a relatively greater frequency of large t-statistics would be observed in the non-event period.

A cross-sectional distribution of excess returns is presented in Table 3 for day -2, day -1, and day -2 to day -1. As explained in note 1, the probability of observing a positive excess return on the CRSP excess returns tape is 0.47.<sup>1</sup> The z-statistics (based on a nonparametric test) reported in Table 3 use the procedure explained in

note 1. It is noticed that the z-statistics in Table 3 are smaller than the corresponding values in Table 2 (based on the parametric test). This is expected since the power of the test for the nonparametric test is usually lower. For day -2, the nonparametric test does not indicate a significant z-statistic, whereas for day -1, the z-statistic is statistically significant. The tenor of the main result is, however, unchanged. The z-statistic for the main days of stock-price reaction (i.e. day -2 to day -1) is 3.00, which is significant at the 1% level.

Stock-price behavior prior to sell-off activity. It was noted that the sellers might be poor performers prior to their sell-off activities. The inclusion of some firms more than once, however, might have caused dependence in time series returns and hence biased the test statistics. To remedy this problem, the following analysis was performed where each firm was included only once in the sample. Further, to avoid the contamination of the results from the sell-off activities, the first available sell-off related date was defined as day zero. Since the WSJI was examined for one to two years prior to the first sell-off date, this period is essentially free from sell-off activities. The results, therefore, indicate the performance of these firms prior to the sell-off activity. The computations are extended backwards to a period of 360 days prior to the first event date. It is seen from Table 4 that these firms, on average, earned an excess return of -11% for day -360 to day -11 (t-statistic of -3.59). The corresponding nonparametric test (as explained in note 1) indicated a z-statistic of -4.3. A number of t-statistics in Panel B of Table 4

indicate that the decline in stock prices is statistically significant. As pointed out earlier, this pattern is similar to that experienced by target firms in merger related studies. For example, Asquith (1983) reports that successful targets earn -14.1% between day -480 and day -20, and unsuccessful targets earn -10.5% over the same period. Similarly, Malatesta (1983) reports that the acquired firms earned -8.5% from month -24 to -4.

Comparison with spin-offs. These results are interesting in that they indicate at least one kind of action (i.e., sell-offs) that may be taken by the managers of the poorly performing firms to improve the welfare of their stockholders. A comparison of these results with those of Miles and Rosenfeld (1983) for a spin-off sample brings about another interesting aspect. In contrast with the negative excess returns reported here, Miles and Rosenfeld find that firms spinning-off their subsidiaries experienced significantly positive excess returns up to 120 days prior to their spin-off announcements. This suggests that, although spin-offs and sell-offs can be used to achieve the same goals, such as reducing firm size, allowing the parent to specialize in fewer business activities, etc., the particular actions taken by firms depend on their performance prior to these decisions. This appeals to logic in that firms not performing well are more likely to face liquidity problems and subsequently engage in sell-offs to overcome these problems. Spin-offs, on the other hand, do not generate cash to the parent company and are thus more likely to be undertaken by firms that have been performing well in the recent past.

Second announcements for sellers (successful sales). The extent to which uncertainty is resolved by the first announcement can be understood by examining the stock price reaction to the subsequent resolution of uncertainty. If the first announcement essentially resolves all the uncertainty, the stock price reaction to subsequent announcements (e.g., final settlement, vote by the board, etc.) would be zero. On the other hand, the first announcements could represent partial resolution only.

In Table 5, excess returns are reported for the second dates when the outcome is favorable. The number of these news items is smaller than the first dates since all the events are not necessarily reported twice. The results are, however, similar to the first date results. For a period of day -5 to day -1, the announcement is associated with a statistically significant positive excess return of 0.9% (t-statistic of 3.99). In this 5-day period, two of the 1-day components (i.e., day -1 and day -3) also reflect statistically significant positive excess returns (t-statistics of 4.79 and 2.96 respectively). Also, as before, the test-statistics appear to be properly specified in that we do not observe unusually large t-statistics for periods subsequent to day zero. A cross-sectional examination similar to the first announcement dates was also performed. For brevity, details are not presented. The nonparametric test indicated z-statistics of 0.89, 2.14, and 2.82 for day -2, day -1, and day -2 to day -1 respectively. The tenor of the results from the nonparametric tests are the same as those from the parametric tests.

These results indicate that most uncertainty is not resolved at the first announcements. This is useful to know for the test of subsequent hypotheses in which comparisons need to be made across poorly performing firms and healthy firms, etc. It would be best to include all news items (announcements) in comparison across groups of firms. Before proceeding to the other hypotheses, it is illustrative to examine the results for all announcements for all the firms in the sample.

All announcements together for sellers. In Table 6, excess returns are presented for the stock price effect on these firms from all the news items. Under the assumption that for each firm the number of sell-offs are actually the result of one underlying plan, it is possible to estimate the effect of these sell-off plans on the firms in our sample. The table also reports the number of firms and the associated CAERs which are the cross-sectional sums of all the announcements. It is seen that an average firm in this sample earned a significant positive excess return of 3.4% (day -5 to day -1). The t-statistic for this is 4.84. For individual days in this period, the t-statistics for day -1 and day -2 are 6.33 and 2.40 respectively. Given these results, there seems to be little doubt that the stock price reaction to the sell-off news items is on average positive for the sellers. These results confirm the earlier conclusion that hypothesis 1 is supported by the data.

A cross-sectional examination of excess returns for all announcements together (for day -2, day -1, and day -2 to day -1) is presented in Table 7. This analysis is similar to the analysis of

first announcement presented earlier in Table 3. Although the  $z$ -statistics in Table 7, using a nonparametric test, are smaller than the corresponding parametric  $t$ -statistics in Table 6, the tenor of the results is unchanged. The  $z$ -statistic for day -2 to day -1 is 2.88, which is statistically significant at the 1% level.

In testing hypotheses 2 to 6, the analysis essentially involves an extended partitioning of the Table 6 results. Table 6 has presented the results of all the firms together, while hypotheses 2 to 6 require similar results for particular subgroups of this sample.

### Hypothesis 2

For testing hypothesis 2 (and also other hypotheses), all the firms need to be separated into either poorly performing or healthy firms. As described in Chapter III, two approaches are adopted. Before proceeding to the results of hypothesis 2, a brief description of the methods labeling firms as poorly performing and healthy is presented.

Classification of firms as poorly performing or healthy. Two general procedures are used to classify firms as poorly performing or healthy firms. The first one is based on the distribution of cumulative average excess returns (CAER) in the period prior to the first sell-off announcement, and the second one is based on the probability of default measure from Ohlson's model. For the first measure, it is necessary to select a pre-event period. Since the optimal length of the pre-event period is not known a priori, two CAERs

are calculated for all the firms in the sample. These two CAERs, designated as CAER-360, -11 and CAER-260, -11, are defined as follows:

CAER-360,-11 = CAER for 350 days from day -360 to day -11, and

CAER-260,-11 = CAER for 250 days from day -260 to -11.

A distribution of these two variables is presented in Table 8. Since the measure CAER-260, -11 is part of CAER-360, -11, both are expected to be significantly correlated, unless adding 100 days in CAER-360, -11 adds a considerable amount of noise in the data. If the correlation between the two variables is low, it would be better to pick the shorter period. Both parametric and nonparametric measures indicate that the two variables are significantly correlated (at less than 0.01 level). The main advantage of this confirmation is that any one of the two would be a good measure for splitting the firms in two groups, those performing poorly and those that are healthy. Although much of the ensuing analysis was performed by using both these measures, the discussion is limited to only one of the two measures (i.e., CAER-360,-11 measure), since the results are very similar.

To classify firms in the poorly performing group and the healthy group, two cutoff levels of the discriminating variable are chosen. The deciles of the two measures are also presented in Table 8. The firms with CAER-360,-11 less than -0.05 (i.e., -5%) are designated as poorly performing firms. Similarly, the firms with CAER-360,-11 greater than +0.05 (i.e., 5%) are designated as healthy firms. This selection of cutoff points was chosen arbitrarily from observing the entire distribution of the variable CAER-360, -11. The cutoff

points, however, seem to be satisfactory as they resulted in 40 firms that were not classified in either group (i.e., with CAER<sub>-360</sub>, -11 between +0.05 and -0.05). A value larger than 0.05 would result in eliminating a larger number of firms and thus reducing the sample size. On the other hand, a smaller value may not have enough discriminating ability.

To classify the firms using an alternative measure, the probability of default (PDEF) was calculated in the year prior to the year of the first sell-off by using Ohlson's model (for the subset of firms for which data were available). If Ohlson's model (described in Chapter III) is stationary over the years, it should result in a response variable which is between 0.0 and 1.0. The results, however, are very different. The mean probability of default measure is 1.61 with a standard deviation of 1.16. The distribution of the probability of default variable is presented in Table 9. One possible reason for high values of the PDEF measure may be that debt-equity ratio of firms in general has gone up. Since debt-equity ratio is positively correlated with PDEF and the model was estimated (by Ohlson) from data of the early 1970s, the PDEF measures of firms in the later years have larger values. This measure is also not correlated the variable CAER<sub>-360</sub>, -11 (correlation of 0.0074). It appears that there is a considerable amount of noise in this measure for classifying firms in the two performance categories. Note that the PDEF measure is derived from the data at a point in time, whereas the CAER measure is derived from the stock returns over a period of 350 or 250 days. The two

measures would be correlated if the decline in stock prices in this period is associated with the change in the accounting variables used in calculating the PDEF. In general, these two measures need not be correlated. These two measures reflect two different approaches to classify the firms. In using the PDEF measure, firms with PDEF values smaller than 1.19 are classified as healthy, and firms with PDEF larger than 1.81 are classified as poorly performing. Some additional discussion of analysis using the variable PDEF is presented later along with the discussion of the results for the cross-sectional examination.

In Table 10, results are reported for the firms that are classified as poorly performing when the variable CAER<sub>-360, -1</sub> was used to classify the firms in the sample. The manner of presentation is the same as that of the earlier Tables 2 to 5. There are 183 firms in this group. It is seen that on day -1, the firms, on average, earned 1.9% excess returns, which is statistically significant (t-statistics of 4.74). From panel B, excess returns for day -5 to day -1 is 3.4% (t-statistics of 3.85). Thus the phenomenon that is observed for all the firms in the sample (hypothesis 1) is also true for the poorly performing firms. The results are consistent with hypothesis 2.

For hypothesis 2, as well as for hypotheses 3 to 6, the portfolio analysis was also performed by using the PDEF measure described above and presented in Table 9. The tenor of the results is not changed in any of the cases and, therefore, additional tables are not presented. For example, when the PDEF measure is used, for poorly performing firms, the t-statistic on day -1 is 4.35 compared to 4.74 observed in Table 10.

### Hypothesis 3

Before presenting results for this hypothesis, it is necessary to briefly describe the procedure for grouping the firms as (i) those disposing profitable segments, and (ii) those disposing unprofitable segments. The main idea was described in Chapter III. For each firm in the sample for which data are available, the gain or loss amount of discontinued operations was obtained from the Compustat tape. A firm in our sample could, however, sell assets over more than one year. In those cases, the amounts for discontinued operations were added together for the relevant years. This procedure is also useful to reduce the "estimation error" in amounts for discontinued operations because the firm can report estimated amounts in the first year. When the results are reported in the subsequent year or years, the initial estimate is taken into account.

From the initial sample of 328 firms, data are available for 254 firms. The average amount of discontinued operations reported is \$-7.38 million, which has a standard deviation of \$62.09 million. The maximum and minimum amounts are \$413.05 and \$-532.50 million, respectively. A distribution of this variable is presented in Table 11. From observing the distribution, the firms that reported \$-1.00 million or less are designated as firms disposing of unprofitable units (group A), and firms reporting \$1.00 million and more are designated as firms disposing of profitable units (group B). Notice that a large number of (i.e. 118 out of 254 or 46.4 percent) have zero gain (or

loss) on discontinued operation. This arises because the Compustat tape reports a zero when the firm does not report a specific amount for discontinued operations. The firms are not required to report the amount of discontinued operations when the amount is not material. Also, some sell-offs need not be reported as discontinued operations if the segment being sold does not meet the criteria of the Accounting Principles Board Opinion No. 30 for separate reporting under the "discontinued operations" caption. For the classification of firms into selling profitable segments and selling unprofitable segments, all these firms are deleted from the sample.

To test hypothesis 3, we need to compare excess returns from group A and group B. It is possible to report excess returns separately for group A and group B and then to report the difference. To keep the number of reported tables manageable, the results are reported only for the difference between excess returns for portfolios consisting of group A firms (i.e., portfolio A) and group B firms (i.e., portfolio B). The numbers of firms in portfolios A and B are 49 and 21 respectively. Since the number of firms are different in the two portfolios, the excess returns for the individual portfolios are divided by the corresponding number of firms. This reflects excess returns to a representative (average) firm in each portfolio. The difference between the two can then be used to test hypothesis 3.

Table 12 presents the difference in the excess returns for the two portfolios (portfolio A and portfolio B). The results indicate that excess returns around day zero are insignificantly different from

zero. The excess return for day -5 to day -1 has a t-statistic of 1.10. The results indicate that the excess returns to firms selling unprofitable segments are not different from the excess returns to firms selling profitable segments. For the two portfolios separately, the excess returns on day -1 are approximately +3.0% each, which is about the same as for an average firm in the entire sample reported in Table 6. The results are not consistent with hypothesis 3 in that there is no difference in the excess returns earned by the firms selling unprofitable segments and the firms selling profitable segments. One possible reason for the insignificant results is that the profitability of the segment may not be a satisfactory surrogate for the related cash flow. It is possible that an unprofitable segment has positive cash flow and the vice versa. Since the change in the financial health of a firm is more likely to be affected by cash flow, the profitability measure essentially has a measurement error for the purpose at hand. Similarly, firms with essentially a zero amount shown as discontinued operations could have significant cash flow effects. This source of measurement error may lead to some misclassifications and, therefore, reduce the power of the test.

#### Hypothesis 4

This hypothesis relates to examining excess returns for the group of healthy firms. This group was formed according to the procedure described in the discussion relating to hypothesis 2 and earlier.

There are 94 firms in this group. Table 13 presents excess returns for this group of firms. On day -1, the firms on average earn a 1.9% excess return which is statistically significant (t-statistics of 2.73). It may be noticed that the magnitude of 1.9% is the same as that for the poorly performing firms (hypothesis 2, Table 10). From panel B, excess return for day -5 to day -1 is only 0.13%, which is statistically insignificantly different from zero. It seems that the 5-day period is probably too long a period for this analysis. The excess returns for day -2 to day -5 are essentially zero. The strong reaction is on day -1. In sum, the results are consistent with hypothesis 4, which posits that healthy firms are expected to experience a positive effect on their stock prices around the sell-off announcements.

#### Hypothesis 5

This hypothesis expands on the results of hypothesis 4. From the group of healthy firms, the excess returns for firms that sold unprofitable segments (group C) are compared with the excess returns for firms that sold profitable units (group D). In this respect, this hypothesis is similar to hypothesis 3, except that this one is for the group of healthy firms, whereas hypothesis 3 is for poorly performing firms. The results are presented in Table 14. The sample size for this extension is smaller than the earlier analysis. The numbers of firms in group C and group D are 17 and 11 respectively. The results

are not clearcut. The differences between the excess returns of two portfolios on day -1 and day 0 are not statistically different from zero. On day -2, however, the difference is -8.46%, which has a t-statistic of -3.06. Although -8.46% appears to be of large magnitude, it should be seen in light of the small sample size and the fact that this is a difference between the two portfolios' excess returns. From panel B, the cumulative excess return from day -5 to day -1 is not significant.

In sum, the results are not consistent with hypothesis 5. If at all, the day -2 result is opposite to that proposed in the hypothesis. Given the small sample size for testing this hypothesis and the fact that it is a day -2 result and not a day -1 result, it is difficult to draw any definite conclusion. This may be a useful topic to pursue in the future. Also, as discussed earlier, the accounting profitability measure may be an unsatisfactory surrogate for cash flow.

#### Hypothesis 6

This hypothesis compares excess returns for the poorly performing firms (groups A and B) and the healthy firms (groups C and D). It is essentially an examination of the difference between the results reported in Tables 10 and 13. The results are reported in Table 15, which indicate that there is no statistically significant difference between the excess returns of these two groups. All the t-statistics (absolute values) around day 0 are less than 2. The results,

therefore, do not reject the null hypothesis, which posits that there is no difference in the excess returns experienced by the group of healthy firms and poorly performing firms.

Although no specific hypothesis required a comparison of excess returns for groups of firms that sold unprofitable segments (groups A and C) and firms that sold profitable segments (groups B and D), an examination revealed that there is no significant difference in the excess returns earned by these two groups.

The general result from the above analysis (hypotheses 2 to 6 results) is that the four groups of firms partitioned according to the two discriminating variables experience similar excess returns around sell-off announcements. This result could also arise from a low power of the test because of limited development of the underlying finance theory. In general, for any financial planning objective (e.g., to reduce the debt-equity ratio), the management has a number of alternatives. Finance theory is not fully enough developed to suggest an unambiguous choice among the available alternatives. In the sell-off case, for example, it is possible for management to alternatively raise funds by issuing equity or debt. The partitioning of firms in different groups, therefore, is noisy and thereby reduces the power of the test.

Additional analysis for tests of hypotheses 2 to 6. For testing hypotheses 2 to 6, the above analysis included forming portfolios using two discriminating variables: (i) a measure of firm performance in the year prior to the first sell-off related announcement to categorize

firms as poorly performing and healthy, and (ii) a measure of the profitability of the disposed segments to categorize firms as those selling profitable units and those selling unprofitable units. Since both measures (i) and (ii) are continuous measures, it is possible to use them as independent variables in a regression framework with excess returns as the dependent variable. The cross-sectional regression therefore, takes the following form:

$$ER_i = a + b \text{ PERF}_i + c \text{ GAIN}_i + u_i$$

where  $ER_i$  = Excess return for firm  $i$ ,

$\text{PERF}_i$  = A measure of firm's performance represented by

CAER-360, -11 or PDEF,

$\text{GAIN}_i$  = A measure of the profitability of the disposed units

represented by PROFM and PROFB (explained below), and

$u_i$  = A random error term.

In estimating the above regression, the variable  $ER_i$  should include only those days around the sell-off announcements where the stock-price reaction is most prominent. A longer time period will increase the magnitude of measurement error in the variable  $ER_i$  and therefore reduce the power of the test. From earlier tables (especially Tables 2 and 6), it can be inferred that most of the effect occurs on day -2 and day -1. Smaller effect can be observed until day -5. Before day -5, however, there appears to be no sell-off related effect. The equations are estimated for four measures of the dependent variable (i.e. day -2, day -1, day -2 to day -1, and day -5 to day -1). Also, the independent variable  $\text{PERF}_i$  has two measures, i.e.

CAER<sub>-360</sub>, <sub>-11</sub> and PDEF. The variable GAIN represents profitability of the discontinued operations. This variable is measured as reported dollar amount of discontinued operations scaled by the size of the firm (measured by book value of equity or market value of equity at the year-end prior to the first sell-off related announcement) since the same dollar amount of reported gain or loss is relatively more important for smaller firms. Thus the variable GAIN also has two proxies represented by PROFM (reported gain or loss divided by market value of equity) and PROFB (reported gain or loss divided by book value of equity).

Results are initially reported for simple regressions in Table 16 with ER as the dependent variable and a number of independent variables. The two measures of a firm's performance (PDEF and CAER<sub>-360</sub>, <sub>-11</sub>) are not correlated with ER. This suggests that the stock price reaction around sell-off announcements does not depend on how the firm was performing in the pre-event period. Notice that hypotheses 2 and 4 suggest that both types of firms (poorly performing and healthy) are expected to experience positive stock price reaction. The above result only indicates that there is no significant difference between the stock price reaction experienced by these two groups. Since all firms, on average, earn positive excess returns, the two groups separately must also, on average, earn positive excess returns to obtain this result. This result is also consistent with the earlier observation based on the portfolio level analysis in testing hypothesis 6.

The measure of profitability of segments being disposed is significantly correlated with ER (t-statistic of -3.37) only for day -1 (and hence also for day -2 to day -1) and when the book value of equity is used to deflate the dollar amount of discontinued operation. This variable is also significant (not reported) when all the observations (for the independent variable) that had zero values were deleted from the analysis. The Spearman-Rank correlation is, however, insignificantly different from zero. This suggests that the significance level from the parametric test cannot be taken seriously. Also, the magnitude of simple correlation coefficient is only -0.21 (i.e.  $R^2$  of about 4%), which suggests that the observed association is weak. The sign of the slope coefficient is, however, consistent with the hypotheses 3 and 5 that firms selling relatively unprofitable units experience larger excess returns. In the earlier portfolio level test of hypothesis 5, the excess returns for the two groups of firms were not different from one another on day -1, but on day -2 the test statistic was statistically significant. In the regression analysis, however, the results are not significant. This difference is probably because the standard deviation of an individual firm's excess returns (used in the regression analysis) is larger than the standard deviation of portfolio excess returns used in the earlier analysis.

Results for cross-sectional tests that use two independent variables, as suggested in the above equation, essentially are the same as those of the simple regression case. A number of regressions were estimated with different definitions of firm's performance in the

pre-event period and the profitability of the disposed segments. Since the results are not changed from the simple regression case, only two sets of results are presented in Table 17. It is noticed that the variable PROFB is significant, although the t-statistic is only about 2.0. In effect, the magnitude of the slope coefficient and the associated t-statistic for the variable PROFB are very similar to those in the simple and multiple regression case. Although a t-statistic of 2.0 is theoretically significant at the 5% level, the result could not be considered compelling because the Spearman-Rank correlation (as reported earlier) is statistically insignificant. It does, however, suggest that future research based on discontinued operations data from the financial reports (as opposed to the Compustat tape) may provide more interesting findings. To summarize, the results of the regression in general are consistent with the earlier results at the portfolio level.

#### Hypothesis 7

This hypothesis compares a number of financial (accounting) ratios for the firms in the sample. The financial ratios are examined for all the firms in the sample and then separately for the poorly performing firms and healthy firms. In general, there is no definite theoretical guideline that may be used to select the ratios for this purpose. From previous empirical studies on bankruptcy however, it is possible to be somewhat objective in selecting the ratios. The

relevant previous studies include Beaver (1966), Deakin (1972), Abdel-Khalik (1973), Ohlson (1980), and other references in these papers.

As a broad category, the debt-equity ratio always seems to be an important variable to classify firms' financial health. The ensuing analysis uses three different measures of the debt-equity ratio. In all, four broad financial ratio categories examined for this purpose are (i) debt-equity ratio, (ii) a measure of earnings, (iii) a measure of cash flow, and (iv) a measure of current liquidity. Since more than one ratio for each category is used, there are ten ratios in total that have been examined. These have been defined in detail in Table 18.

In comparing ratios across time, it is necessary to adjust for the possibility that over time the industry wide ratios might have also changed. These changes could occur because of unknown factors, such as tax changes, technological changes, changes in accounting rules, etc. Foster (1978, Ch. 6), for example, documents a number of ratios over the period 1947-1975. Among other factors, it is observed that the debt-equity ratio has steadily increased over the years. The possibility of changes in financial ratios being associated with factors other than sell-offs is controlled for as follows. Let

$R_{ib}$  = financial ratio for firm  $i$  before sell-off,

$I_{ib}$  = financial ratio of industry (in which firm  $i$  belongs) for the same year as  $R_{ib}$ ,

$D_{ib} = (R_{ib} - I_{ib}) / I_{ib}$ , which represents the percentage difference between the financial ratio of firm from the industry average before sell-off.

Similarly  $R_{ia}$ ,  $I_{ia}$ , and  $D_{ia}$  are defined for the years corresponding to the year after sell-offs. A variable change  $C_i$  is defined as

$$C_i = D_{ib} - D_{ia}.$$

Under the assumption that the financial ratios of firms engaging in sell-offs move along with the financial ratios of the corresponding industry, the expected value of  $C_i$  is zero. In that case, one-half of the observations for  $C_i$  are expected to be positive and one-half are expected to be negative. In other words,  $C_i$  has a binomial distribution with mean zero and  $p=0.5$ , where  $p$  is the expected value of observing a positive number. For a given sample size of  $n$ , the expected number of positive  $C_i$  is  $np$  and the associated variance is  $np(1-p)$ . Results from this test and related tests of statistical significance levels ( $z$ -statistics) are presented in Tables 19 and 20.

Two definitions of industry are used for this analysis: (i) four digit SIC codes and (ii) two digit SIC codes. The SIC codes used with the Compustat tape are based on the United States Department of Commerce's Standard Industrial Classification (SIC) codes. All the firms available on the tape (except firms that are engaged in sell-offs) are used in computing the industry averages. Two separate definitions each are used for designating the year before sell-off and the year after sell-off. These are

Year A: One year before the first available sell-off related date,

Year B: The year in which the first sell-off related date occurs,

Year C: The year in which the last sell-off related date occurs,  
and

Year D: One year after the last available sell-off related date.

In all, four comparisons are made across these years for changes  
in financial ratios: (i) between years A and C, (ii) between years A  
and D, (iii) between years B and C, and (iv) between years B and D.

Table 19 presents results for the four different comparisons when  
four digit SIC codes are used for industry classification. Similarly,  
Table 20 presents results when two digit SIC codes are used. The  
analysis is further extended to analyze the results separately for  
poorly performing firms and healthy firms. These results are presented  
in Tables 21 to 24. Although the number of firms varies across the  
comparisons for different ratios, the total number of firms (for Tables  
19 and 20) is approximately 250. Similarly, there are approximately  
140 firms in the poorly performing group and 70 firms in the healthy  
group (healthy firms).

The z-statistics in Tables 19 to 24 are presented such that a  
positive value (for all ratios) indicates that the financial ratio  
under examination has improved. For the debt-equity measure, it seems  
that the ratio has moved towards industry average. The debt-equity  
ratios #1 and #3 are based on book values and are therefore less  
volatile. Ratio #2 is expected to be more volatile because the  
denominator is the market value of equity. An examination of ratios #1  
and #3, say for years B to C, indicate that they are in most tables  
greater than 2. This observation is consistent with the prediction of

hypothesis 7. Note that the results are based on a nonparametric test and hence conservative. For the other three categories (viz., current liquidity measure, cashflow measure, and the earnings measure), the ratios do not change significantly. In sum, it seems that the financial ratios of the sell-off firms, except for the debt-equity ratio, do not change substantially in comparison with the industry ratios. Thus, the results are only partially supportive of hypothesis 7.

#### Hypothesis 8

This hypothesis proposes an examination of excess returns around dates when the firms engaging in sell-offs are confronting difficulties in previously announced sell-off plans. The results are presented in Table 25.

The results indicate that the unsuccessful negotiations or other reasons for abandoning earlier reported plans result in negative stock price reaction to the sellers. The firms on average experience a -0.59% excess return on day -1, the t-statistic for which is -2.76. The t-statistics for other days around this are not significant. This suggests that the abandonment news (unsuccessful negotiations, etc.) does not leak prior to the announcements by the firms. For the cumulative period of day -5 to -1, the results are also not significant. Cross-sectionally, 63.5% of the excess returns were negative on day -1, which is statistically significant. In sum, the results are consistent with hypothesis 8.

### Hypothesis 9

This hypothesis examines the excess returns for firms around the dates when the announcements are related to sales of segments that are made to insiders (managers, directors, or other stockholders that own more than 10% of the common stocks). In Table 26, results are presented for 63 announcements that fall in this category. The excess returns around day zero are not significant. The cumulative excess return for day -5 to day -1 is only -0.1% compared to 0.7% in Table 2. An examination of the difference between the two cases indicated that announcements other than the sales to insiders are associated with statistically larger excess returns to the selling firms than the announcements that are related to sales to insiders. It should, however, be noticed that the number of announcements reported in Table 26 is only 63 compared to over 1000 announcements reported in Table 2. Since the results in Table 26 do not indicate any strong disposition, it is possible that a larger sample would provide a more definite answer. In sum, however, the present results are consistent with hypothesis 9.

### Hypothesis 10

This hypothesis examines the excess returns earned by the buyers. Table 27 presents the average excess returns earned by the buyers around the first announcement dates for the events. Since all the

buyers are either not known or their stock prices are not listed on the CRSP excess returns tape, the number of first events for the buyers in the sample on day -1 is only 304 as opposed to 1062 for the sellers. The buyers earn a statistically significant positive excess return on day -1 (0.34% with a t-statistic of 2.43). For days -5 to -1, the CAER is, however, insignificantly different from zero. Further, the behavior of the stock prices before and after the event day is essentially random, confirming market efficiency and the appropriateness of the test statistics.

The above result is in contrast to the results obtained in the merger related studies where the returns to the bidders (i.e., buyers) are essentially zero. The two or three day announcement effect (i.e., the day before, the day of announcement, and the day after) is significantly negative in Dodd (1980), but positive and insignificant in Asquith (1983) and Eckbo (1983). Jensen and Ruback (1983, p. 16) summarize these and other studies and conclude that "the estimated abnormal returns to successful bidding firms in all six studies . . . suggest that mergers are zero net present value investments for bidders . . . except for the Dodd estimates." This result is consistent with the argument that the acquisition market for mergers is perfectly competitive.<sup>3</sup> The results presented here are consistent with the hypothesis that the sell-off market is relatively less competitive than the takeover (merger) market. From reading over 500 news items in the WSJ, it appears that there are very few sell-off cases where a second buyer has competitively negotiated with the seller. An extensive

analysis of the extent and the nature of the competitiveness in the various markets is, however, beyond the scope of this dissertation.

The analysis is extended to the second dates and the abandonment dates, and the results are presented in Tables 28 and 29. For the second date, the buyers earn a statistically significant positive excess return on day -2 (t-statistics of 2.54), although day -1 returns are close to zero. The buyers do not earn significantly positive or negative excess returns around the reported abandonment dates. In sum, the buyers appear to earn statistically significant, although small in absolute percentage, positive excess returns, reflecting a positive net present value investment on their part.<sup>4</sup> These results are consistent with the prediction of hypothesis 10.

### Hypothesis 11

This hypothesis suggests a cross-sectional regression in which the dependent variable is the excess return around the sell-off announcements. The basic idea is to explain the magnitude of the excess returns earned. From earlier results (for example, Table 6), it appears that most stock price effects associated with the sell-off announcements occur in a 5-day period (day -5 to day -1). The analysis for the cross-sectional hypothesis is, however, made for two different periods (i) day -5 to day -1, and (ii) day -2 to day -1. The 2-day period was also chosen as an additional period because the most pronounced stock price reaction is observed to occur in this 2-day

period. The results from the two separate examinations are essentially the same, and therefore the discussion is limited to the 5-day period results.

As suggested in Chapter II, the cross-sectional analysis is performed for all the firms together, and also separately for the poorly performing firms and the healthy firms. In Table 30, the means and standard deviations are presented for the variables that are used subsequently in the cross-sectional regressions. Note that the numbers of poorly performing firms and healthy firms do not add to the total because some firms from the middle (which are discarded) do not fall into either of the two defined categories. An average firm earns 3.7% excess return in the 5-day period, and the cross-sectional examination is performed to see if the variation in this return can be explained by the variables presented.

To start with, three simple regressions (i.e., with one independent variable) are run, and the results are presented in Tables 31 to 33 for all the firms, for poorly performing firms and for healthy firms, respectively. It is important to examine the results for simple regressions because it is unlikely that the simple regression results change when multiple regressions are run. The statistical significance of the intercept term only indicates that the regression line does not go through the origin. In our context, it basically indicates that the average excess return (after adjusting for the effect of one variable) is significantly different from zero.

The important statistics for our purpose in these tables are the slope coefficients. When the firms are combined (Table 25), neither of

the two variables, i.e.,  $DE_1-DE_2$  and  $DE_1-DE_3$ , are significant. This result, however, needs to be examined separately for the poorly performing firms and healthy firms for testing hypothesis 11. The third variable (variance) was included because of the suggestion in Jain (1982). He argues that in a cross-sectional regression of this type, the coefficients of the included variable may be biased if the included variable is correlated with the variance. To alleviate this problem, the variance should be included as an explanatory variable. Consistent with his results, this variable is significant. This suggests that in running the cross-sectional regressions, variance of excess returns should be included in the estimated regressions. For the poorly performing firms (Table 32), the variable  $DE_1-DE_2$  is statistically significant (and of predicted sign) at the 1% level of significance. This result is consistent with hypothesis 11, suggesting that the effect of proceeds from sell-offs on the debt-equity ratio is associated with the stock price response. The second variable, and also variance, is not significant. Also, for the healthy firms (Table 33), none of the variables is significant, which is also consistent with the hypothesis.

In Table 34, the results are presented for the multiple regressions, i.e., when all the three variables are included together as independent variables. The results corroborate those of the simple regressions. Certain diagnostic checks were also performed. In Table 35, simple correlations among the three independent variables are presented. These do not appear to be excessive. In any case,

muticollinearity does not seem to be an important factor since the results did not change between simple regressions and multiple regressions. To reduce the possibility of heteroscedastic errors, the excess returns were divided by their corresponding standard errors, and the results were the same. Also, deletion of two extreme positive and two extreme negative excess returns from the sample did not change the results.

All the regressions were run with three different definitions of debt-equity ratio as defined in Table 18. Since the results are qualitatively the same, they are not presented for the other two definitions (ratios #2 and #3). In measuring  $DE_3$ , the results presented use the debt-equity ratio of the sell-off firms for the year after the last sell-off related announcement. Two other definitions were also used for  $DE_3$ : (i) four digit industry average of debt-equity ratio, and (ii) two digit industry average of debt-equity ratio. These ratios are the same as those used in ratio analysis (hypothesis 7). As noted above, this variable (i.e.,  $DE_1-DE_3$ ) does not contribute significantly in the cross-sectional regressions and the two additional definitions did not change the earlier findings. Additionally, the replacement of the debt-equity measure with the PDEF variable (probability of default measure explained in the discussion of hypothesis 2) also did not change results. Note that when  $DE_1-DE_2$  is replaced by the corresponding  $PDEF_1-PDEF_2$ , there is essentially a scale transfer because the only variable that changed  $PDEF_1$  to  $PDEF_2$  is the debt-equity ratio. All the other variables that are

used in calculating  $PDEF_1$  and  $PDEF_2$  remain the same. The replacement of  $DE_3$  by  $PDEF_3$ , however, is not a simple scale transformation. A correlation between debt-equity ratio and  $PDEF$  indicates (Table 35) that the two are highly correlated. It is therefore not surprising that the results are not changed when  $PDEF$  is used instead of debt-equity ratio.

The extended analysis suggests that the basic findings are robust for many different definitions of the variables used in the analysis. In sum, the results are partially supportive of hypothesis 11 in the sense that one of the two hypothesized explanatory variables is statistically significant (and positively correlated with excess returns) in explaining the cross-sectional variation in the excess returns earned by the poorly performing firms around sell-off announcements.

#### Notes

1. The cross-sectional examination follows the following approach. For a binomial distribution, the expected number of positive excess returns are  $np$  where  $n$  is the sample size and  $p$  is the probability of observing a positive excess return. The value of  $p$ , estimated from all the excess returns for the first 200 firms on the tape is 0.47. Brown, Kleidon, and Marsh (1983) also report similar results for all firms on the tape for the period 1976 to 1978. The variance for the observed number of positive excess returns is  $np(1-p)$ . From this, a z-statistic can be calculated as (actual positive excess returns-expected number)/standard deviation. For larger numbers (larger than 30 or so), Snedecor and Cochran (1979) suggest that the Normal approximation of the binomial distribution can be used. The z-statistic is, therefore, a standard Normal variate.

2. As explained in Chapter IV, for each sell-off related announcement, two additional dates (pre-date and post-date) are also used to control for the effects of confounding events. All the results relating to excess returns are examined after deleting the announcements where pre-dates and post-dates occur within 5 days of the sell-off related announcements. None of the ensuing conclusion is affected, although some of the statistics are different in magnitude.
3. Asquith, Bruner, and Mullins (1983) argue that the studies examining the returns to bidders do not control for many important factors such as the time period in which the bid occurs, the target size, and the success of the merger bid. In their study they find that the control of these factors result in significant excess returns to bidders as well.
4. This result is also in contrast with the results reported in Mandelker (1974), Langetieg (1978), and Asquith (1983) where the bidders (buyers) are reported to earn positive returns in the pre-event period.

Table 2

Sellers: First Announcement Dates

Panel A. Average Excess Returns (AER), t-statistics for AER, and Cumulative Average Excess Returns (CAER) around the Sell-off News Items.

Day	No. of Events	AER	t-stat
-120	1068	0.0006	0.76
-100	1065	-0.0009	-1.21
-80	1058	0.0007	0.97
-60	1069	-0.0005	-0.69
-40	1067	-0.0004	-0.53
-20	1068	-0.0024	-3.20**
-10	1068	0.0003	0.37
-9	1068	0.0002	0.27
-8	1068	-0.0014	-1.92
-7	1068	-0.0024	-3.21**
-6	1067	-0.0007	-0.88
-5	1068	0.0001	0.09
-4	1068	0.0006	0.80
-3	1067	0.0000	0.05
-2	1064	0.0016	2.15*
-1	1062	0.0044	5.95**
0	1063	0.0009	1.27
1	1067	-0.0003	-0.41
2	1067	-0.0004	-0.52
3	1067	-0.0011	-1.50
4	1069	0.0007	0.96
5	1069	-0.0006	-0.83
6	1067	0.0007	0.92
7	1064	0.0006	0.84
8	1064	0.0003	0.40
9	1065	0.0010	1.37
10	1064	-0.0013	-1.73
20	1056	-0.0023	-3.15**
40	1062	-0.0006	-0.76
60	1056	-0.0013	-1.73
80	1053	0.0012	1.68
100	1049	0.0006	0.77
120	1043	-0.0009	-1.25

Panel B. Time Series t-stats for various Intervals.

Interval (Days)			CAER	t-stat
-120 TO -61			-0.013	-2.23*
-120 TO -11			-0.035	-4.54**
-60 TO -11			-0.022	-4.29**
-10 TO -6			-0.004	-2.40*
-5 TO -1			0.007	4.04**
1 TO 5			-0.002	-1.03
6 TO 10			0.001	0.40
11 TO 60			-0.006	-1.13
61 TO 120			-0.002	-0.28
11 TO 120			-0.007	-0.97

\* : significant at 5% level of significance.

\*\* : significant at 1% level of significance.

Day 0 : Date of the publication of the news in the Wall Street Journal.

Table 3

Sellers: First Announcement Dates  
 Cross-sectional Distribution of Excess Returns  
 for Selected Days and Periods

A. Decile	Day -2	Day -1	Days -2 to -1
0.0 (Minimum)	-0.1723	-0.2752	-0.2647
0.1	-0.0236	-0.0253	-0.0316
0.2	-0.0143	-0.0153	-0.0206
0.3	-0.0084	-0.0094	-0.0121
0.4	-0.0045	-0.0040	-0.0049
0.5	-0.0007	0.0006	0.0008
0.6	0.0036	0.0041	0.0071
0.7	0.0083	0.0097	0.0141
0.8	0.0155	0.0183	0.0240
0.9	0.0289	0.0355	0.0471
1.0 (Maximum)	0.3032	0.3388	0.3995
B. No. of observations	1064	1062	1064
C. Mean excess return	0.0016	0.0044	0.0060
D. % of positive excess returns	48.97	51.69	51.60
E. z-statistic for D	1.29	3.07**	3.00**

\* : Significant at 5% level of significance.

\*\* : Significant at 1% level of significance.

Table 4

Sellers: Pre-Event Period

Panel A. Average Excess Returns (AER), t-statistics for AER, and Cumulative Average Excess Returns (CAER) around the Sell-off News Items.

Day	No. of Events	AER	t-stat
-360	312	-0.0025	-1.55
-340	311	-0.0007	-0.49
-320	311	0.0017	1.07
-300	309	0.0004	0.26
-280	310	0.0009	0.56
-260	310	-0.0000	-0.05
-240	312	-0.0016	-1.04
-220	311	0.0002	0.13
-200	310	-0.0005	-0.36
-180	312	-0.0008	-0.51
-160	312	-0.0009	-0.58
-140	312	0.0006	0.41
-120	311	0.0007	0.45
-100	309	-0.0014	0.88
-80	309	-0.0003	-0.24
-60	310	-0.0020	-1.28
-40	310	0.0027	1.69
-20	310	-0.0032	-2.02*
-10	311	0.0024	1.51
-9	311	-0.0003	-0.22
-8	311	-0.0031	-1.95
-7	311	-0.0048	-3.03**
-6	311	-0.0016	-1.03
-5	312	-0.0021	-1.33
-4	312	0.0008	0.55
-3	312	0.0009	0.57
-2	311	0.0040	2.51*
-1	311	0.0056	3.53*
0	311	-0.0005	-0.31
1	312	0.0002	0.17
2	311	-0.0026	-1.64
3	311	0.0017	1.08
4	312	0.0039	2.41*
5	312	-0.0012	-0.80
6	312	0.0004	0.30

Panel B. Time Series t-stats for various Intervals.

Interval (Days)			CAER	t-stat
-360 TO -241			-0.03	-1.73
-360 TO -121			-0.07	-2.87**
-360 TO -61			-0.08	-2.81**
-360 TO -11			-0.11	-3.59**
-240 TO -121			-0.04	-2.34*
-240 TO -61			-0.05	-2.22*
-240 TO -11			-0.08	-3.17**
-120 TO -61			-0.01	-0.54
-120 TO -11			-0.04	-2.15*
-60 TO -11			-0.03	-2.60**
-10 TO -6			-0.01	-2.10*
-5 TO -1			0.01	2.60**
1 TO 5			0.00	0.54
5 TO 10			0.00	0.35
11 TO 60			-0.01	-0.84
61 TO 120			-0.00	-0.25
11 TO 120			-0.01	-0.75

Table 4 Continued

Panel A. Average Excess Returns (AER), t-statistics for AER, and Cumulative Average Excess Returns (CAER) around the Sell-off News Items.

Day	No. of Events	AER	t-stat
7	312	-0.0000	-0.04
8	311	-0.0000	-0.06
9	311	0.0037	2.33*
10	311	-0.0014	-0.87
20	312	-0.0008	-0.19
40	312	0.0020	1.28
60	311	-0.0022	-1.41
80	310	0.0021	1.30
100	312	0.0006	0.39
120	309	-0.0017	-1.10

\* : significant at 5% level of significance.

\*\* : significant at 1% level of significance.

Day 0 : Date of the publication of the news in the Wall Street Journal.

Table 5

Sellers: Second Announcement Dates

Panel A. Average Excess Returns (AER), t-statistics for AER, and Cumulative Average Excess Returns (CAER) around the Sell-off News Items.

Day	No. of Events	AER	t-stat
-120	491	-0.0011	-1.14
-100	493	0.0010	1.03
-80	493	-0.0013	-1.30
-60	492	-0.0013	-1.33
-40	494	0.0018	1.84
-20	496	-0.0012	-1.18
-10	497	0.0011	1.12
-9	497	0.0013	1.32
-8	496	0.0023	2.25*
-7	496	-0.0007	-0.67
-6	494	0.0021	2.13*
-5	495	0.0006	0.58
-4	495	-0.0003	-0.31
-3	494	0.0030	2.95**
-2	491	0.0009	0.91
-1	485	0.0048	4.79**
0	488	-0.0012	-1.16
1	492	-0.0016	-1.60
2	495	0.0016	1.58
3	496	-0.0003	-0.33
4	496	0.0006	0.58
5	496	0.0015	1.54
6	496	-0.0008	-0.76
7	496	0.0008	0.79
8	496	0.0003	0.25
9	496	0.0014	1.38
10	496	-0.0005	-0.52
20	496	-0.0016	-1.60
40	494	0.0011	1.07
60	495	0.0008	0.82
80	491	0.0009	0.89
100	490	-0.0006	-0.60
120	490	-0.0006	-0.61

Panel B. Time Series t-stats for various Intervals.

Interval (Days)			CAER	t-stat
-120 TO -61			-0.009	-1.11
-120 TO -11			-0.001	-0.07
-60 TO -11			0.008	1.12
-10 TO -6			0.006	2.75**
-5 TO -1			0.009	3.99**
1 TO 5			0.002	0.79
6 TO 10			0.003	1.09
11 TO 60			-0.012	-1.69
61 TO 120			0.005	0.69
11 TO 120			0.007	-0.63

\* : significant at 5% level of significance.

\*\* : significant at 1% level of significance.

Day 0 : Day of the publication of the news in the Wall Street Journal.

Table 6

Sellers, All Sell-off Related Dates

Panel A. Average Excess Returns (AER), t-statistics for AER, and Cumulative Average Excess Returns (CAER) around the Sell-off News Items.

Day	No. of Firms	AER	t-stat
-120	313	0.0001	0.03
-100	312	-0.0011	-0.34
-80	313	-0.0010	-0.32
-60	312	-0.0045	-1.41
-40	313	0.0020	0.64
-20	313	-0.0099	-3.14**
-10	313	0.0028	0.88
-9	313	0.0027	0.84
-8	313	-0.0013	-0.42
-7	313	-0.0102	-3.21**
-6	313	0.0015	0.49
-5	313	-0.0003	-0.10
-4	313	0.0010	0.31
-3	313	0.0059	1.87
-2	313	0.0076	2.40*
-1	312	0.0201	6.33**
0	312	-0.0001	-0.04
1	313	-0.0042	-1.32
2	313	-0.0012	0.36
3	313	-0.0052	-1.64
4	313	0.0021	0.66
5	313	0.0014	0.45
6	313	0.0004	0.14
7	313	0.0048	1.53
8	313	0.0008	0.26
9	313	0.0060	1.88
10	313	-0.0044	-1.38
20	314	-0.0101	-3.17**
40	315	-0.0001	-0.03
60	314	-0.0019	-0.61
80	314	0.0059	1.85
100	314	-0.0003	-0.10
120	311	-0.0048	-1.53

Panel B. Time Series t-stats for various Intervals.

Interval (Days)	CAER	t-stat
-120 TO -61	-0.061	-2.49*
-120 TO -11	-0.133	-3.99**
-60 TO -11	-0.071	-3.19**
-10 TO -6	-0.005	-0.64
-5 TO -1	0.034	4.84**
1 TO 5	-0.005	-0.67
6 TO 10	0.009	1.17
11 TO 60	-0.045	-2.00*
61 TO 120	-0.003	-0.13
11 TO 120	-0.048	-1.44

\* : significant at the 5% level of significance.

\*\* : significant at the 1% level of significance.

Day 0 : Day of the publication of the news in the Wall Street Journal.

Table 7

Sellers: All Sell-off Related Dates  
 Cross-sectional Distribution of Excess Returns  
 for Selected Days and Periods

A. Decile	Day -2	Day -1	Days -2 to -1
0.0 (Minimum)	-0.3239	-0.3573	-0.5971
0.1	-0.0546	-0.0459	-0.0600
0.2	-0.0297	-0.0235	-0.0343
0.3	-0.0133	-0.0137	-0.0190
0.4	-0.0066	-0.0045	-0.0036
0.5	0.0021	-0.0020	0.0073
0.6	0.0095	0.0131	0.0181
0.7	0.0208	0.0248	0.0338
0.8	0.0419	0.0502	0.0786
0.9	0.0979	0.1188	0.1674
1.0 (Maximum)	0.3113	0.6941	0.8059
B. No. of observations	312	311	312
C. Mean excess return	0.0076	0.0200	0.0276
D. % of positive excess returns	53.21	54.49	55.13
E. z-statistic for D	2.20*	2.65**	2.88**

\* : Significant at 5% level of significance.

\*\* : Significant at 1% level of significance.

Table 8

Cumulative Average Excess Return (CAER) for the Sell-off Firms  
in Periods Prior to Sell-off

	Day -360 to Day -11	Day -260 to Day -11
a. Mean CAER	-0.1083	-0.0794
b. Standard deviation	0.4226	0.3330
c. Deciles of CAER		
0.0 (Minimum)	-1.1819	-1.0365
0.1	-0.5936	-0.4693
0.2	-0.4230	-0.3272
0.3	-0.3262	-0.2297
0.4	-0.2191	-0.1555
0.5	-0.1256	-0.0874
0.6	-0.0424	-0.0216
0.7	0.0462	0.0373
0.8	0.2023	0.1369
0.9	0.3603	0.3352
1.0 (Maximum)	1.8531	1.0986
d. No. of positives	109	118
e. No. of negatives	205	196
f. The cut-off points for labeling the firms as		
(i) poorly performing firms	-0.05	-0.04
(ii) not poorly performing firms	+0.05	+0.04
g. Correlation between the two variables:		
(i) simple correlation	: 0.89 (significance level: less than 0.01)	
(ii) Spearman-Rank correlation	: 0.86 (significance level: less than 0.01)	

Table 9

Probability of Default (PDEF) Measure using Ohlson's  
Model for the Sell-off Firms in the Year Prior to Sell-off.

No. of Firms: 240

Deciles	PDEF
0.0 (Minimum)	-1.7966
0.1	0.1896
0.2	0.6917
0.3	0.9948
0.4	1.1904
0.5	1.5294
0.6	1.8058
0.7	2.1684
0.8	2.5154
0.9	3.0849
1.0 (Maximum)	6.0950
Mean PDEF	1.60
Standard deviation of PDEF	1.16
No. of positive PDEF	225
No. of negative PDEF	15
Correlations between PDEF and CAER-360, -11	
i) Simple correlation	0.0074
ii) Spearman-Rank correlation	0.0118
Correlations between PDEF and CAER-260, -11	
i) Simple correlation	0.0549
ii) Spearman-Rank correlation	0.0719

Table 10

Sellers: Poorly Performing Firms

Panel A. Average Excess Returns (AER), t-statistics for AER, and Cumulative Average Excess Returns (CAER) around the Sell-off News Items.

Day	No. of Firms	AER	t-stat
-120	183	-0.0020	-0.50
-100	183	-0.0044	-1.10
-80	183	0.0034	0.85
-60	183	0.0003	0.08
-40	183	-0.0013	-0.33
-20	183	-0.0095	-2.38*
-10	183	-0.0007	-0.18
-9	183	0.0073	1.83
-8	183	-0.0038	-0.95
-7	183	-0.0103	-2.57*
-6	183	0.0019	0.47
-5	183	-0.0024	-0.50
-4	183	0.0023	0.57
-3	183	0.0078	1.94
-2	183	0.0079	1.96*
-1	183	0.0190	4.74**
0	183	-0.0040	-1.01
1	183	-0.0066	-1.54
2	183	0.0069	1.71
3	183	-0.0062	-1.56
4	183	0.0019	0.48
5	183	0.0001	0.02
6	183	0.0030	0.75
7	183	0.0043	1.08
8	183	0.0060	1.51
9	183	0.0028	0.70
10	183	0.0028	0.71
20	183	-0.0163	-4.06**
40	183	-0.0009	-0.22
60	183	-0.0021	-0.52
80	183	0.0060	1.49
100	183	-0.0007	-0.16
120	183	-0.0087	-2.17*

Panel B. Time Series t-stats for various Intervals.

Interval (Days)	CAER	t-stat
-120 TO -61	-0.140	-4.51**
-120 TO -11	-0.273	-6.51**
-60 TO -11	-0.133	-4.71**
-10 TO -6	-0.006	-0.62
-5 TO -1	0.034	3.85**
1 TO 5	-0.004	-0.44
6 TO 10	0.013	1.49
11 TO 60	-0.070	-2.47*
61 TO 120	-0.022	-0.72
11 TO 120	-0.092	-2.20*

\* : significant at the 5% level of significance.

\*\* : significant at the 1% level of significance.

Day 0 : Day of the publication of the news in the Wall Street Journal.

Table 11

Distribution of the Variable Gain or Loss on  
Discontinued Operations for the Sell-off Firms.

No. of Firms: 254

Deciles	Gain or Loss (\$million)
0.0 (Minimum)	-532.5
0.1	- 30.2
0.2	- 7.5
0.3	- 0.9
0.4	0.0
0.5	0.0
0.6	0.0
0.7	0.0
0.8	0.0
0.9	3.5
1.0 (Maximum)	413.1
Mean	- 7.4
Standard deviation	62.1
Number of negatives	91
Number of positives	45
Number of zeros	118

Table 12

Sellers: for Poorly Performing Firms, the Difference between Firms Selling Profitable Segments and Unprofitable Segments

Panel A. Average Excess Returns (AER), t-statistics for AER, and Cumulative Average Excess Returns (CAER) around the Sell-off News Items.

Day	No. of Firms#	AER	t-stat
-120		0.0126	0.90
-100		-0.0090	-0.64
-80		-0.0052	-0.37
-60		-0.0100	-0.71
-40		0.0001	0.01
-20		-0.0112	-0.80
-10		-0.0169	-1.20
-9		0.0100	0.71
-8		-0.0034	-0.24
-7		-0.0141	-1.00
-6		-0.0069	-0.49
-5		0.0175	1.24
-4		0.0071	0.50
-3		0.0120	0.85
-2		0.0167	1.19
-1		-0.0186	-1.32
0		0.0014	0.10
1		0.0050	0.36
2		0.0039	0.27
3		-0.0243	-1.73
4		-0.0107	-0.76
5		0.0006	0.04
6		0.0030	0.21
7		0.0061	0.44
8		0.0060	0.43
9		0.0119	0.85
10		-0.0197	-1.40
20		-0.0325	-2.32*
40		-0.0160	-1.14
60		0.0094	0.67
80		0.0111	0.79
100		0.0164	1.17
120		-0.0181	-1.28

Panel B. Time Series t-stats for various Intervals.

Interval (Days)	CAER	t-stat
-120 TO -61	-0.064	-0.59
-120 TO -11	-0.627	-4.26**
-60 TO -11	-0.563	-5.67**
-10 TO -6	-0.031	-0.99
-5 TO -1	0.035	1.10
1 TO 5	-0.026	-0.81
6 TO 10	0.007	0.24
11 TO 60	-0.136	-1.37
61 TO 120	-0.106	-0.98
11 TO 120	-0.242	-1.64

# : No. of firms selling profitable segments: 21

No. of firms selling unprofitable segments: 49

\* : significant at the 5% level of significance.

\*\* : significant at the 1% level of significance.

Day 0 : Day of the publication of the news in the Wall Street Journal.

Table 13

## Sellers: Healthy Firms

Panel A. Average Excess Returns (AER), t-statistics for AER, and Cumulative Average Excess Returns (CAER) around the Sell-off News Items.

Day	No. of Firms	AER	t-stat
-120	94	0.0025	0.36
-100	94	0.0060	0.86
-80	94	-0.0063	-0.90
-60	94	-0.0071	-1.02
-40	94	0.0039	0.56
-20	94	-0.0085	-1.22
-10	94	0.0113	1.63
-9	94	0.0007	0.11
-8	94	0.0025	0.35
-7	94	-0.0139	-2.01*
-6	94	-0.0014	-0.21
-5	94	-0.0004	-0.05
-4	94	-0.0039	-0.56
-3	94	0.0022	0.31
-2	94	-0.0037	-0.54
-1	94	0.0190	2.73**
0	94	0.0121	1.74
1	94	-0.0006	-0.09
2	94	-0.0093	-1.34
3	94	-0.0052	-0.75
4	94	0.0035	0.50
5	94	0.0059	0.85
6	94	-0.0047	-0.68
7	94	0.0072	1.04
8	94	-0.0043	-0.63
9	94	0.0136	1.96*
10	94	-0.0082	-1.18
20	94	0.0002	0.03
40	94	0.0007	0.10
60	94	-0.0060	-0.87
80	94	0.0074	1.06
100	94	0.0024	0.34
120	94	0.0011	0.16

Panel B. Time Series t-stats for various Intervals.

Interval (Days)			CAER	t-stat
-120 TO -61			0.036	0.67
-120 TO -11			0.052	0.72
-60 TO -11			0.016	0.33
-10 TO -6			-0.001	-0.05
-5 TO -1			0.013	0.85
1 TO 5			-0.006	-0.37
6 TO 10			0.004	0.23
11 TO 60			-0.018	-0.37
61 TO 120			0.022	0.40
11 TO 120			0.004	0.05

\* : significant at the 5% level of significance.

\*\* : significant at the 1% level of significance.

Day 0 : Day of the publication of the news in the Wall Street Journal.

Table 14

Sellers: for Healthy Firms, the Difference between Firms  
Selling Profitable Segments and Unprofitable Segments

Panel A. Average Excess Returns  
(AER), t-statistics for AER, and  
Cumulative Average Excess Returns  
(CAER) around the Sell-off News  
Items.

Day	No. of Firms#	AER	t-stat
-120		0.0121	0.44
-100		0.0343	1.24
-80		-0.0111	-0.40
-60		0.0213	0.77
-40		-0.0003	-0.01
-20		0.0099	0.36
-10		0.0541	1.96*
-9		0.0138	0.50
-8		0.0008	0.03
-7		-0.0284	-1.02
-6		0.0043	0.15
-5		0.0306	1.11
-4		0.0358	1.29
-3		-0.0102	-0.37
-2		-0.0846	-3.06**
-1		0.0304	1.10
0		0.0188	0.68
1		0.0052	0.19
2		-0.0345	-1.25
3		0.0654	2.36**
4		-0.0767	-2.77**
5		0.0179	0.65
6		-0.0484	-1.75
7		0.0033	0.12
8		-0.0034	-0.12
9		0.0127	0.46
10		-0.0098	-0.35
20		-0.0357	-1.29
40		0.0318	1.15
60		0.0251	0.91
80		0.0150	0.54
100		0.0134	0.48
120		-0.0036	-0.13

Panel B. Time Series t-stats for  
various Intervals.

Interval (Days)	CAER	t-stat
-120 TO -61	0.381	1.78
-120 TO -11	0.057	0.20
-60 TO -11	-0.324	-1.65
-10 TO -6	0.045	0.72
-5 TO -1	0.002	0.03
1 TO 5	-0.023	-0.37
6 TO 10	-0.046	-0.74
11 TO 60	0.063	0.32
61 TO 120	0.028	0.13
11 TO 120	0.091	0.31

# : No. of firms selling profitable segments: 11

No. of firms selling unprofitable segments: 17

\* : significant at the 5% level of significance.

\*\* : significant at the 1% level of significance.

Day 0 : Day of the publication of the news in the Wall Street Journal.

Table 15

Sellers: Difference between Poorly Performing Firms  
and Healthy Firms

Panel A. Average Excess Returns  
(AER), t-statistics for AER, and  
Cumulative Average Excess Returns  
(CAER) around the Sell-off News  
Items.

Day	No. of Firms#	AER	t-stat
-120		-0.0045	-0.54
-100		-0.0104	-1.24
-80		0.0096	1.15
-60		0.0074	0.88
-40		-0.0052	-0.62
-20		-0.0011	-0.13
-10		-0.0120	-1.44
-9		0.0066	0.79
-8		-0.0063	-0.75
-7		0.0036	0.44
-6		0.0033	0.40
-5		-0.0020	-0.24
-4		0.0061	0.73
-3		0.0056	0.67
-2		0.0116	1.39
-1		0.0000	0.00
0		-0.0161	-1.93
1		-0.0060	-0.71
2		0.0162	1.93
3		-0.0010	-0.12
4		-0.0016	-0.19
5		-0.0058	-0.69
6		0.0077	0.92
7		-0.0029	-0.35
8		0.0104	1.24
9		-0.0108	-1.29
10		0.0053	0.64
20		-0.0165	-1.97*
40		-0.0016	-0.19
60		0.0040	0.47
80		-0.0014	-0.17
100		-0.0030	-0.36
120		-0.0098	-1.17

Panel B. Time Series t-stats for  
various Intervals.

Interval (Days)			CAER	t-stat
-120 TO -61			-0.176	-2.72**
-120 TO -11			-0.326	-3.71**
-60 TO -11			-0.150	-2.53*
-10 TO -6			-0.005	-0.25
-5 TO -1			0.021	1.14
1 TO 5			0.002	0.10
6 TO 10			0.010	0.52
11 TO 60			-0.052	-0.88
61 TO 120			-0.044	-0.68
11 TO 120			-0.096	-1.09

# : No. of firms in poorly performing group: 183

No. of firms in not poorly performing group: 94

\* : significant at the 5% level of significance.

\*\* : significant at the 1% level of significance.

Day 0 : Day of the publication of the news in the Wall Street Journal.

Table 16

Simple Regressions with Excess Returns as the Dependent Variable  
and Different Independent Variables

Independent Variables	Slope (t-statistic)	Simple Correlation	F-statistic (significance level)	Spearman- Rank Correlation
A. Dependent Variable $ER_i$ for day -2:				
PDEF	-0.0051 (-0.18)	-0.08	1.40 (0.24)	-0.01
PROFM	-0.0015 (-0.14)	-0.01	0.02 (0.89)	-0.06
PROFB	0.0036 (0.30)	0.02	0.09 (0.77)	-0.05
CAER-360, -11	-0.0013 (-0.11)	-0.01	0.13 (0.91)	-0.03
B. Dependent Variable $ER_i$ for day -1:				
PDEF	0.0073 (1.69)	0.11	2.87 (0.09)	0.11
PROFM	-0.0160 (-1.45)	-0.10	2.12 (0.15)	-0.04
PROFB	-0.041* (-3.37)	-0.21	11.38* (0.01)	-0.05
CAER-360, -11	-0.0176 (-1.59)	-0.10	2.53 (0.11)	-0.06
C. Dependent Variable $ER_i$ for day -2 to day -1:				
PDEF	0.0023 (0.35)	0.02	0.12 (0.72)	0.05
PROFM	-0.0175 (-1.07)	-0.07	1.14 (0.28)	-0.08
PROFB	-0.0370* (-2.03)	-0.13	4.14* (0.04)	-0.08

Table 16 Continued

Independent Variables	Slope (t-statistic)	Simple Correlation	F-statistic (significance level)	Spearman-Rank Correlation
CAER <sub>-360</sub> , -11	-0.0258 (-1.49)	-0.10	2.21 (0.13)	-0.06
D. Dependent Variable ER <sub>i</sub> for day -5 to day -1:				
PDEF	0.0115 ( 1.31)	0.08	1.72 (0.19)	0.04
PROFM	-0.0314 (-1.46)	-0.09	2.11 (0.14)	-0.08
PROFB	-0.0374 (-1.52)	-0.10	2.31 (0.13)	-0.04
CAER <sub>-360</sub> , -11	-0.0075 (-0.32)	-0.01	0.10 (0.75)	-0.00

\* : Significant at less than 5% level of significance.

Table 17

Regressions with Excess Returns as the Dependent Variable  
and Two Independent Variables

Independent Variables	Slope Coefficients for Different Regressions (t-statistics in parentheses)			
	(1)	(2)	(3)	(4)
A. Dependent Variable ER is for day -2 to day -1:				
Intercept	0.0172 ( 1.32)	0.0197 ( 1.52)	0.0147 ( 1.89)	0.0155 ( 2.03)
PDEF	0.0011 ( 0.17)	-0.0009 (-0.13)		
CAER-360, -11			-0.0268 (-1.56)	-0.0262 (-1.52)
PROFM	-0.0170 (-1.02)		-0.0195 (-1.21)	
PROFB		-0.0376* (-2.00)		-0.0368* (-2.04)
R <sup>2</sup>	0.0050	0.0176	0.0155	0.0259
F-statistic (significance level)	0.58 (0.55)	13.98* (0.00)	1.90 (0.15)	3.21* (0.04)
B. Dependent Variable ER is for day -5 to day -1:				
Intercept	0.0081 ( 0.46)	0.0105 ( 0.59)	0.0010 ( 0.20)	0.0029 ( 0.55)
PDEF	0.0097 ( 1.08)	0.0089 ( 0.98)		
CAER-360, -11			-0.0058 (-0.51)	-0.0053 (-0.45)
PROFM	-0.0274 (-1.25)		-0.0014 (-0.13)	
PROFB		-0.0315 (-1.24)		0.0050 ( 0.41)

Table 17 Continued

Independent Variables	Slope Coefficients for Different Regressions (t-statistics in parentheses)			
	(1)	(2)	(3)	(4)
R <sup>2</sup>	0.0140	0.0139	0.0011	0.0015
F-statistic (significance level)	1.64 (0.19)	1.64 (0.19)	0.13 (0.87)	0.19 (0.83)

\* : Significant at less than 5% level of significance.

Table 18

## Definition of Ten Financial Ratios in Four Broad Categories

I. Debt-Equity Measure:

Ratio # 1: L.T.D./Book Value of Equity

Ratio # 2: L.T.D./Market Value of Equity

Ratio # 3: (L.T.D. + Current Liabilities)/Total Assets

II. Earnings Measure:

Ratio # 4: Earnings/Total Assets

Ratio # 5: Earnings/Net Sales

III. Cashflow Measure:

Ratio # 6: Cashflow Definition 1/Net Sales

Ratio # 7: Cashflow Definition 2/Net Sales

IV. Current Liquidity Measure:

Ratio # 8: Current Assets/Current Liabilities

Ratio # 9: (Current Assets-Current Liabilities)/Total Assets

Ratio #10: (Current Assets-Inventories)/Current Liabilities

where,

L.T.D. = Long Term Debt

Earnings = Income before extraordinary items and discontinued operations.

Cashflow Definition 1 = Earnings + Depreciation

Cashflow Definition 2 = Earnings + Depreciation + Deferred taxes +  
Unremitted earnings of unconsolidated subsidiaries +  
Extraordinary items + Minority interest

Table 19

Financial Ratios Before and After Sell-offs  
for all Firms in the Sample (Industry = Four Digit SIC Code)#

z-statistics for Comparisons between the Following Years				
	A and C	A and D	B and C	B and D
I. Debt-Equity Measure:				
Ratio # 1	3.39**	2.51*	2.38*	2.01*
Ratio # 2	0.50	0.25	2.64*	2.26*
Ratio # 3	2.16*	1.39	2.92*	1.71
II. Earnings Measure:				
Ratio # 4	-1.54	-2.07*	-1.48	-0.91
Ratio # 5	2.63*	1.12	1.89	1.31
III. Cashflow Measure:				
Ratio # 6	2.43*	0.93	0.78	0.53
Ratio # 7	0.47	0.13	1.53	1.47
IV. Current Liquidity Measure:				
Ratio # 8	0.51	0.38	3.04**	0.89
Ratio # 9	1.56	1.56	2.08*	1.30
Ratio #10	2.55*	2.55*	0.89	-0.51

\* : significant at 5% level of significance.

\*\* : significant at 1% level of significance.

# : number of firms is approximately 250 (some variation across cells exists because of missing data).

Table 20

Financial Ratios Before and After Sell-offs  
for all Firms in the Sample (Industry = Two Digit SIC Code)#

	z-statistics for Comparisons between the Following Years			
	A and C	A and D	B and C	B and D
I. Debt-Equity Measure:				
Ratio # 1	2.38*	3.51**	3.51**	3.51**
Ratio # 2	0.88	1.13	1.25	1.13
Ratio # 3	1.90	1.46	3.16**	2.60**
II. Earnings Measure:				
Ratio # 4	-0.95	-1.54	-1.77	-1.08
Ratio # 5	0.73	0.53	0.00	0.46
III. Cashflow Measure:				
Ratio # 6	0.65	0.19	-0.26	-0.26
Ratio # 7	0.13	0.59	2.22*	2.34*
IV. Current Liquidity Measure:				
Ratio # 8	0.13	0.13	1.39	0.25
Ratio # 9	0.94	0.84	1.42	0.39
Ratio #10	2.28*	1.14	0.63	-1.14

\* : significant at 5% level of significance.

\*\* : significant at 1% level of significance.

# : number of firms is approximately 250 (some variation across cells exists because of missing data).

Table 21

Financial Ratios Before and After Sell-offs for Poorly  
Performing Firms in the Sample (Industry = Four Digit SIC Code)#

z-statistics for Comparisons between the Following Years				
	A and C	A and D	B and C	B and D
I. Debt-Equity Measure:				
Ratio # 1	2.52*	1.51	2.01*	2.51*
Ratio # 2	-0.17	-0.67	1.51	0.34
Ratio # 3	0.93	0.85	2.97**	2.20*
II. Earnings Measure:				
Ratio # 4	-1.03	-1.65	-0.77	-0.79
Ratio # 5	1.58	0.89	1.13	0.97
III. Cashflow Measure:				
Ratio # 6	1.47	0.26	0.17	0.61
Ratio # 7	0.72	1.17	2.47*	2.04*
IV. Current Liquidity Measure:				
Ratio # 8	-0.34	-0.34	2.20*	1.18
Ratio # 9	0.35	-0.17	1.22	0.70
Ratio #10	1.20	1.53	0.34	0.51

\* : significant at 5% level of significance.

\*\* : significant at 1% level of significance.

# : number of firms is approximately 140 (some variation across cells exists because of missing data).

Table 22

Financial Ratios Before and After Sell-offs  
for Healthy Firms in the Sample (Industry = Four Digit SIC Code)#

z-statistics for Comparisons between the  
Following Years

	A and C	A and D	B and C	B and D
I. Debt-Equity Measure:				
Ratio # 1	3.11**	2.39*	2.43*	2.94**
Ratio # 2	1.20	0.48	2.39*	1.96*
Ratio # 3	2.53*	0.72	2.57**	0.12
-----				
II. Earnings Measure:				
Ratio # 4	-0.84	-1.08	-0.60	-0.12
Ratio # 5	1.97*	0.98	0.98	0.74
-----				
III. Cashflow Measure:				
Ratio # 6	1.86	0.87	0.25	-0.25
Ratio # 7	0.87	-0.62	0.00	0.50
-----				
IV. Current Liquidity Measure:				
Ratio # 8	1.43	0.24	1.91	-0.72
Ratio # 9	1.81	0.84	0.60	-0.12
Ratio #10	2.87**	0.96	0.24	-1.43

\* : significant at 5% level of significance.

\*\* : significant at 1% level of significance.

# : number of firms is approximately 70 (some variation across cells exists because of missing data).

Table 23

Comparison of Financial Ratios Before and After Sell-offs for Poorly Performing Firms (Industry = Two Digit SIC Code)#

z-statistics for Comparisons between the  
Following Years

	A and C	A and D	B and C	B and D
I. Debt-Equity Measure:				
Ratio # 1	2.01*	2.35*	2.85**	2.52*
Ratio # 2	-0.34	-0.34	-0.17	-0.67
Ratio # 3	0.68	0.68	2.37*	2.54*
-----				
II. Earnings Measure:				
Ratio # 4	-0.59	-1.20	-1.69	-1.45
Ratio # 5	-0.35	0.26	0.26	1.23
-----				
III. Cashflow Measure:				
Ratio # 6	-0.51	0.09	0.09	0.26
Ratio # 7	0.52	1.30	3.31**	2.94**
-----				
IV. Current Liquidity Measure:				
Ratio # 8	-0.85	-0.34	1.18	1.18
Ratio # 9	0.43	-0.35	0.78	0.43
Ratio #10	0.68	0.68	0.00	-0.17

\* : significant at 5% level of significance.

\*\* : significant at 1% level of significance.

# : number of firms is approximately 140 (some variation across cells exists because of missing data).

Table 24

Comparison of Financial Ratios Before and After Sell-offs for  
Healthy Firms in the Sample (Industry = Two Digit SIC Code)#

z-statistics for Comparisons between the Following Years				
	A and C	A and D	B and C	B and D
I. Debt-Equity Measure:				
Ratio # 1	2.39*	2.87**	2.39*	2.63**
Ratio # 2	1.67	0.96	2.39*	1.91
Ratio # 3	2.63**	0.84	2.63**	0.84
-----				
II. Earnings Measure:				
Ratio # 4	-0.73	-0.73	0.00	-0.24
Ratio # 5	1.52	0.25	-0.87	-0.37
-----				
--				
III. Cashflow Measure:				
Ratio # 6	1.34	-0.12	-0.97	-0.73
Ratio # 7	0.88	0.63	-0.25	0.74
-----				
--				
IV. Current Liquidity Measure:				
Ratio # 8	0.96	-0.48	0.24	-1.91
Ratio # 9	0.48	0.72	0.48	-0.72
Ratio #10	2.39*	-0.24	0.00	-2.39*

\* : significant at 5% level of significance.

\*\* : significant at 1% level of significance.

# : number of firms is approximately 70 (some variation across cells exists because of missing data).

Table 25

## Sellers: Abandonment Dates

Panel A. Average Excess Returns (AER), t-statistics for AER, and Cumulative Average Excess Returns (CAER) around the Sell-off News Items.

Day	No. of Events	AER	t-stat
-120	129	-0.0000	-0.02
-100	129	0.0008	0.37
-80	129	-0.0034	-1.59
-60	129	-0.0015	-0.71
-40	127	0.0011	0.51
-20	129	-0.0000	-0.00
-10	126	0.0001	0.07
-9	126	-0.0003	-0.16
-8	127	-0.0002	-0.09
-7	127	-0.0025	-1.19
-6	127	0.0010	0.45
-5	127	-0.0036	-1.70
-4	128	-0.0013	-0.62
-3	129	0.0027	1.26
-2	128	0.0018	0.87
-1	127	-0.0059	-2.76**
0	128	-0.0037	-1.72
1	129	-0.0015	-0.71
2	129	-0.0001	-0.05
3	129	-0.0022	-1.03
4	129	-0.0030	-1.43
5	129	0.0026	1.21
6	129	-0.0016	-0.74
7	129	0.0035	1.68
8	129	-0.0014	-0.68
9	129	0.0008	0.38
10	129	0.0019	0.90
20	129	0.0010	0.45
40	127	0.0003	0.12
60	125	0.0026	1.24
80	123	0.0008	0.38
100	125	-0.0032	-1.51
120	123	-0.0020	-0.93

Panel B. Time Series t-stats for various Intervals.

Interval (Days)			CAER	t-stat
-120 TO -61			-0.03	-1.25
-120 TO -11			-0.01	-0.58
-60 TO -11			-0.02	-1.21
-10 TO -6			-0.00	-0.41
-5 TO -1			-0.01	-1.31
1 TO 5			-0.00	-0.90
6 TO 10			0.01	1.12
11 TO 60			-0.01	-0.94
61 TO 120			-0.02	-0.93
11 TO 120			-0.03	-1.33

\* : significant at the 5% level of significance.

\*\* : significant at the 1% level of significance.

Day 0 : Day of the publication of the news in the Wall Street Journal.

Table 26

Sellers: Sales to Insiders

Panel A. Average Excess Returns (AER), t-statistics for AER, and Cumulative Average Excess Returns (CAER) around the Sell-off News Items.

Day	No. of Events	AER	t-stat
-120	62	-0.0016	-0.44
-100	62	-0.0014	-0.38
-80	62	0.0020	0.54
-60	63	0.0037	1.01
-40	63	0.0001	0.01
-20	63	-0.0019	-0.53
-10	63	0.0003	0.07
-9	63	-0.0058	-1.57
-8	63	-0.0068	-1.84
-7	63	-0.0022	-0.60
-6	63	-0.0016	-0.44
-5	63	-0.0031	-0.85
-4	63	0.0003	0.08
-3	63	-0.0014	-0.37
-2	63	-0.0001	-0.03
-1	63	0.0037	0.99
0	63	0.0047	1.28
1	63	0.0007	0.18
2	63	0.0001	0.02
3	63	0.0028	0.76
4	63	-0.0044	-1.19
5	63	-0.0016	-0.45
6	63	0.0002	0.07
7	63	0.0042	1.14
8	63	-0.0007	-0.19
9	63	0.0066	1.79
10	63	0.0012	0.31
20	63	-0.0008	-0.21
40	63	0.0012	0.32
60	63	-0.0072	-1.95
80	63	-0.0031	-0.84
100	63	0.0007	0.18
120	63	-0.0030	-0.81

Panel B. Time Series t-stats for various Intervals.

Interval (Days)	CAER	t-stat
-120 TO -61	-0.018	-0.64
-120 TO -11	-0.042	-1.08
-60 TO -11	-0.023	-0.90
-10 TO -6	-0.016	-1.95
-5 TO -1	-0.001	-0.08
1 TO 5	-0.003	-0.30
6 TO 10	0.010	1.09
11 TO 60	-0.002	-0.07
61 TO 120	0.005	0.19
11 TO 120	0.004	0.09

\* : significant at the 5% level of significance.

\*\* : significant at the 1% level of significance.

Day 0 : Day of the publication of the news in the Wall Street Journal.

Table 27

Buyers: First Announcement Dates

Panel A. Average Excess Returns (AER), t-statistics for AER, and Cumulative Average Excess Returns (CAER) around the Sell-off News Items.

Day	No. of Events	AER	t-stat
-120	299	0.0018	1.26
-100	301	-0.0018	-1.30
-80	301	-0.0009	-0.65
-60	301	-0.0003	-0.19
-40	301	-0.0001	-0.05
-20	301	-0.0003	-0.20
-10	304	0.0019	1.33
-9	304	-0.0015	-1.08
-8	304	-0.0014	-1.01
-7	304	0.0006	0.42
-6	304	0.0033	2.35*
-5	304	-0.0012	-0.84
-4	304	-0.0006	-0.46
-3	304	-0.0017	-1.18
-2	304	-0.0007	-0.49
-1	304	0.0034	2.43*
0	303	0.0013	0.93
1	303	-0.0014	0.98
2	303	-0.0008	-0.56
3	303	-0.0000	-0.02
4	302	0.0015	1.04
5	302	0.0022	1.56
6	303	-0.0013	-0.95
7	303	-0.0046	-3.28**
8	303	0.0001	0.09
9	303	-0.0024	-1.69
10	303	0.0014	0.99
20	302	0.0000	0.00
40	303	0.0016	1.12
60	302	0.0022	1.57
80	301	0.0021	1.51
100	302	0.0022	1.59
120	302	0.0007	0.50

Panel B. Time Series t-stats for various Intervals.

Interval (Days)	CAER	t-stat
-120 TO -61	-0.019	-1.71
-120 TO -11	-0.010	-0.65
-60 TO -11	0.009	0.91
-10 TO -6	0.003	0.89
-5 TO -1	-0.001	-0.24
1 TO 5	0.004	1.34
6 TO 10	-0.005	-1.34
11 TO 60	-0.003	-0.35
61 TO 120	-0.008	-0.73
11 TO 120	-0.011	-0.77

\* : significant at the 5% level of significance.

\*\* : significant at the 1% level of significance.

Day 0 : Day of the publication of the news in the Wall Street Journal.

Table 28

Buyers: Second Announcement Dates

Panel A. Average Excess Returns (AER), t-statistics for AER, and Cumulative Average Excess Returns (CAER) around the Sell-off News Items.

Day	No. of Events	AER	t-stat
-120	151	-0.0001	-0.03
-100	151	-0.0007	-0.38
-80	151	0.0013	0.70
-60	151	0.0008	0.46
-40	151	0.0023	1.25
-20	151	0.0017	0.93
-10	151	0.0007	0.37
-9	151	-0.0013	-0.73
-8	151	0.0009	0.51
-7	151	0.0003	0.19
-6	151	0.0011	0.60
-5	151	-0.0002	-0.11
-4	151	0.0022	1.21
-3	151	-0.0012	-0.67
-2	151	0.0046	2.54*
-1	151	-0.0011	-0.59
0	151	0.0015	0.85
1	151	0.0023	1.29
2	151	-0.0008	-0.45
3	151	0.0014	0.80
4	151	-0.0003	-0.18
5	151	-0.0001	-0.04
6	151	0.0011	0.63
7	151	0.0002	0.11
8	151	-0.0011	-0.61
9	151	0.0003	0.15
10	151	-0.0010	-0.58
20	151	-0.0009	-0.52
40	152	0.0006	0.32
60	152	-0.0040	-2.23*
80	149	0.0015	0.80
100	149	0.0010	0.53
120	149	0.0022	1.22

Panel B. Time Series t-stats for various Intervals.

Interval (Days)	CAER	t-stat
-120 TO -61	0.001	0.05
-120 TO -11	-0.013	-0.68
-60 TO -11	-0.014	-1.06
-10 TO -6	0.002	0.42
-5 TO -1	0.004	1.06
1 TO 5	0.003	0.64
6 TO 10	-0.001	-0.14
11 TO 60	-0.009	-0.68
61 TO 120	-0.015	-1.09
11 TO 120	-0.024	-1.26

\* : significant at the 5% level of significance.

\*\* : significant at the 1% level of significance.

Day 0 : Day of the publication of the news in the Wall Street Journal.

Table 29

Buyers: Abandonment Dates

Panel A. Average Excess Returns (AER), t-statistics for AER, and Cumulative Average Excess Returns (CAER) around the Sell-off News Items.

Day	No. of Events	AER	t-stat
-120	47	-0.0012	-0.33
-100	47	-0.0032	-0.86
-80	47	0.0023	0.63
-60	47	-0.0030	-0.81
-40	47	0.0081	2.20*
-20	47	0.0021	0.56
-10	47	0.0004	0.11
-9	47	-0.0000	-0.01
-8	47	0.0042	1.14
-7	47	-0.0028	-0.77
-6	47	-0.0017	-0.45
-5	47	-0.0008	-0.21
-4	47	0.0012	0.34
-3	47	-0.0031	-0.86
-2	47	-0.0015	-0.40
-1	47	0.0030	0.82
0	47	0.0004	0.12
1	47	0.0072	1.94
2	47	-0.0058	-1.59
3	47	-0.0008	-0.22
4	47	-0.0012	-0.32
5	47	-0.0005	-0.13
6	47	-0.0028	-0.75
7	47	-0.0034	-0.93
8	47	0.0005	0.14
9	47	0.0010	0.27
10	47	-0.0033	-0.90
20	47	0.0019	0.52
40	47	0.0085	2.30*
60	46	0.0056	1.53
80	46	-0.0034	-0.93
100	46	-0.0072	-1.95
120	46	0.0051	1.40

Panel B. Time Series t-stats for various Intervals.

Interval (Days)	CAER	t-stat
-120 TO -61	0.006	0.20
-120 TO -11	-0.001	-0.03
-60 TO -11	-0.007	-0.26
-10 TO -6	0.000	0.01
-5 TO -1	-0.001	-0.13
1 TO 5	-0.001	-0.14
6 TO 10	-0.008	-0.94
11 TO 60	-0.009	-0.34
61 TO 120	0.039	1.36
11 TO 120	0.030	0.77

\* : significant at the 5% level of significance.

\*\* : significant at the 1% level of significance.

Day 0 : Day of the publication of the news in the Wall Street Journal.

Table 30

Mean and Standard Deviations of Variables Used in  
Cross-sectional Regressions

	All Firms		Poorly Performing Firms		Healthy Firms	
	Mean	Std. dev.	Mean	Std. dev.	Mean	Std. dev.
1. No. of observations		185		105		51
2. Excess return for day -5 to -1 (5-day period)	0.037	0.176	0.044	0.155	-0.008	0.173
3. Proceeds from sell-offs divided by book value of equity	0.540	1.576	0.362	0.602	1.056	2.808
4. Difference between debt-equity ratio before and after sell-offs	0.182	1.109	0.140	1.082	0.213	1.000
5. Variance of excess returns in periods prior to sell-off (X1000)	4.426	6.246	4.122	5.628	6.000	7.731

Table 31

Results of Simple Regressions between Excess Returns and Three  
Different Independent Variables for All Firms in the Sample

	Independent Variables		
	(DE <sub>1</sub> -DE <sub>2</sub> )	(DE <sub>1</sub> -DE <sub>3</sub> )	Variance
Intercept (t-statistic)	0.034 (2.47)*	0.034 (2.57)**	0.015 (0.93)
Slope (t-statistic)	0.005 (0.61)	0.017 (1.45)	0.005 (2.42)*
R-Square	0.0021	0.0113	0.0312
F-statistic	0.37	2.10	5.86
Significance level for F-statistics	0.54	0.15	0.01

\* : significant at 5% level of significance

\*\* : significant at 1% level of significance

Table 32

Results of Simple Regressions between Excess Returns and Three  
Different Independent Variables for Poorly Performing Firms  
in the Sample

	Independent Variables		
	(DE <sub>1</sub> -DE <sub>2</sub> )	(DE <sub>1</sub> -DE <sub>3</sub> )	Variance
Intercept (t-statistic)	0.011 (0.67)	0.042 (2.73)	0.026 (1.41)
Slope (t-statistic)	0.091** (3.84)	0.018 (1.29)	0.004 (1.61)
R-Square	0.1255	0.0159	0.0246
F-statistic	14.77	1.66	2.60
Significance level for F-statistic	0.00	0.20	0.11

\* : significant at 5% level of significance

\*\* : significant at 1% level of significance

Table 33

Results of Simple Regressions between Excess Returns and Three Different Independent Variables for Healthy Firms in the Sample

	Independent Variables		
	(DE <sub>1</sub> -DE <sub>2</sub> )	(DE <sub>1</sub> -DE <sub>3</sub> )	Variance
Intercept (t-statistic)	-0.005 (-0.20)	-0.011 (-0.42)	-0.007 (-0.24)
Slope (t-statistic)	-0.002 (-0.26)	0.014 (0.55)	-0.000 (-0.01)
R-Square	0.0014	0.0061	0.0000
F-statistic	0.07	0.30	0.00
Significance level for F-statistics	0.79	0.59	0.98
* : significant at 5% level of significance			
** : significant at 1% level of significance			

Table 34

Results of Multiple Regressions between Excess Returns and  
Three Independent Variables

	All Firms	Poorly Performing Firms	Healthy Firms
Intercept (t-statistic)	0.015 ( 0.92)	-0.002 (-0.13)	-0.009 (-0.30)
Slope for $DE_1-DE_2$ (t-statistic)	-0.002 (-0.29)	0.092 ( 3.87)**	-0.006 (-0.59)
Slope for $DE_1-DE_3$ (t-statistic)	0.012 ( 1.06)	0.017 ( 1.26)	0.213 ( 0.75)
Slope for Variance (t-statistic)	0.005 ( 2.18)*	0.003 ( 1.01)	0.001 ( 0.19)
R-square	0.0373	0.1565	0.0136
F-statistic	2.32	6.24	0.22
Significance level for F-statistic	0.080	0.000	0.884

\* : significant at the 5% level of significance

\*\* : significant at the 1% level of significance

Table 35  
Simple Correlations Among Independent Variables

Correlations between	All Firms	Poorly Performing Firms	Healthy Firms
(DE <sub>1</sub> -DE <sub>2</sub> ) and (DE <sub>1</sub> -DE <sub>3</sub> )	0.21	-0.07	0.44
(DE <sub>1</sub> -DE <sub>2</sub> ) and Variance	0.29	0.07	0.39
(DE <sub>1</sub> -DE <sub>3</sub> ) and Variance	0.18	0.30	0.07
Probability of Default and Debt-equity Ratio			
(i) before sell-off	0.93	0.93	0.94
(ii) after sell-off	0.94	0.94	0.95

## CHAPTER V

### SUMMARY AND CONCLUSIONS

The results of this study show that publicly available voluntary sell-off announcements have a positive effect on the shareholders of both the sellers and the buyers. For a sample of over 300 firms, the average excess return to the sellers for a five day period is a statistically significant 3.4%. This result differs substantially from the recent study of Alexander et al. (1984), who examined a smaller sample of 53 firms and found essentially insignificant results.

Firms engaging in sell-offs are poor performers in that the sell-off announcements are preceded by a period of negative excess returns, a significant -11% over a period extending from day -360 to day -11 relative to the first sell-off related announcement. In contrast, for spin-off announcements, Miles and Rosenfeld (1983, p. 1605) conclude that "spin-off announcements, on average, follow a period of abnormally positive returns." This suggests that although both spin-offs and sell-offs are associated with contemporaneous positive excess returns, the motivations for the two financial planning decisions have different roots.

In various segments of the examination, the evidence is consistent with the semi-strong form of capital market efficiency. This study,

however, extends earlier results in that the entire market reaction to a sell-off announcement does not occur at the time of the first announcement. Subsequent favorable announcements are also associated with the positive stock price reactions. Abandonment announcements, on the other hand, are associated with negative stock price reactions.

The buyers of the assets also earn statistically significant, albeit small (0.34% on day -1), positive excess returns. In the merger related studies, however, the acquiring firms are found to earn zero or negative (e.g., Dodd, 1980; Asquith, 1983; Eckbo, 1983) excess returns. This difference is consistent with the hypothesis that the sell-off market is less competitive than the takeover market. The results here suggest that sell-offs are positive net present value projects for both the sellers and the buyers and are consistent with value-maximizing behavior by the management. Thus, from the buyers' perspective, the results are not consistent with the size maximizing hypothesis suggested by Mueller (1969) and others.

Excess returns were examined separately for the firms that were performing poorly in years prior to sell-offs and for those that did not fall in this category (the healthy firms). The results indicate that there is no difference between the excess returns earned by these two groups of firms. Both the groups were further divided into firms that sold unprofitable units and firms that sold profitable units. Again, there appears to be no difference between the excess returns earned by these different subgroups.

Ten different financial ratios for all the firms in the sample were examined for differences between these ratios before and after sell-offs. Special care was taken to control for possible temporal changes in industry ratios. Two definitions of industry (4 digit and 2 digit) were used. The ten ratios comprised four broad categories of debt-equity ratio, a measure of earnings, a measure of cashflow, and a measure of liquidity. Only the debt-equity group indicated an improvement in ratios from the before to after sell-off period. All the analysis was extended to analyze the poorly performing and the healthy group of firms separately.

An examination of sell-off announcements related to sales of segments to insiders (managers, directors, etc.) indicates that the firms in these cases did not earn significant (positive or negative) excess returns. The sample size in this case is small (63) because of infrequency of these transactions, and therefore the confidence in these results is low. This, however, offers an area of research that can be explored in the future.

A cross-sectional examination of the excess returns around the sell-off announcements indicates that for poorly performing firms, the excess returns are positively associated with the effect of the proceeds on the debt-equity ratio. This finding is consistent with the hypothesis that for the group of poorly performing firms, the market views the sell-off announcements to be positive steps in the direction of improving the capital structure (debt-equity ratio). The results for firms not performing poorly (healthy firms) lend further support

to this hypothesis since the excess returns to healthy firms are not associated with changes in the debt-equity variable.

Although a great deal about sell-offs has been learned from this study, there is no pretense that the topic of sell-offs has been explored fully. Many interesting issues remain unexplored and may be examined in the future. For example, the role of taxes is not clear in sell-offs. It is possible that some sell-offs are motivated by possible tax-related benefits to the sellers. This can occur when the segment being sold is incurring losses but the owning firm cannot deduct those losses for tax purposes because of insufficient earnings. It might be best for the firm to sell the unit to a profitable company. Of the potential factors that could also be explored to understand the economic determinants of sell-offs are management changes, effects of sell-offs on compensation packages, effects on bond covenants, etc. It is also possible to make an ex-post analysis of the sell-off firms. Did the firms grow more or less than the industry? What did the firms actually do with the proceeds? Given these possible interesting questions that are still unanswered, it is expected that this dissertation will provide a starting point for future studies on sell-offs.

## REFERENCES

- Abdel-Khalik, A.R. (1973), "The effect of aggregating accounting reports on the quality of the lending decision: An empirical investigation," Empirical Research in Accounting: Selected Studies, 1973; Supplement to Journal of Accounting Research (1973), 104-138.
- Abdel-Khalik, A.R., and Bipin B. Ajinkya (1979), Empirical Research in Accounting: A Methodological Viewpoint, Accounting Education Series, Volume 4. (American Accounting Association, Sarasota, Florida).
- Adkins, Lynn (1981), "Divestitures: A new business rage," Dun's Review (March 1981), 111-114.
- Alberts, William M., and James M. McTaggart (1979), "The divestiture decision: An introduction," Mergers and Acquisition (Fall 1979), 17.
- Alexander, Gordon J., P. George Benson, and Joan M. Kampmeyer (1984), "Investigation of the valuation effects of announcements of voluntary corporate sell-offs," The Journal of Finance (June 1984), 503-517.
- Altman, E.I. (1976), "Capitalization of leases and predictability of financial results: A comment," Accounting Review (April 1976), 408-412.
- Anreder, Steven S. (1980), "Move to unbundle: More companies are working their assets harder," Barron's (August 4, 1980), 4-9.
- Asquith, Paul (1983), "Merger bids, uncertainty, and stockholder returns," Journal of Financial Economics (April 1983), 51-84.
- Asquith, Paul, R. F. Bruner, and D. W. Mullins (1983), "The gains to bidding firms from mergers," Journal of Financial Economics (April 1983), 121-140.
- Asset Redeployment (1981), Business Week (August 24, 1981), 54.
- Ball, R., and P. Brown (1968), "An empirical evaluation of accounting income numbers," Journal of Accounting Research (Autumn 1968), 159-178.

- Beaver, W.H. (1966), "Financial ratios as predictors of failure," Empirical Research in Accounting: Selected Studies 1966; Supplement to Journal of Accounting Research (1966), 71-111.
- Beaver, W.H. (1968), "The information content of Annual earnings announcements," Empirical Research in Accounting: Selected Studies; Supplement to the Journal of Accounting Research (1968), 67-92.
- Beaver, W.H. (1981), Financial Reporting: An Accounting Revolution. (Prentice-Hall, Inc., Englewood Cliffs, NJ).
- Beaver, W.H., S. Kettler, and M. Scholes (1970), "The Association between market-determine and accounting-determined risk measures," Accounting Review (October 1970), 654-682.
- Boudreaux, Kenneth (1975), "Divestiture and share price," Journal of Financial and Quantitative Analysis (November 1975), 619-626.
- Brown, Philip, Allan W. Kleidon, and Terry A. Marsh (1983), "New evidence on the nature of size-related anomalies in stock-prices," Journal of Financial Economics (June 1983), 33-56.
- Brown, Stephen J., and Jerold B. Warner (1980), "Measuring security price performance," Journal of Financial Economics (September 1980), 205-258.
- Collins, Daniel W., and Warren T. Dent (1984), "A comparison of alternative testing methodologies used in capital market research," Journal of Accounting Research (Spring 1984), 48-84.
- Collins, Daniel W., Michael S. Rozeff, and Dan S. Dhaliwal (1981), "A cross-sectional analysis of the economic determinants of market reaction to proposed mandatory accounting changes in the oil and gas industry," Journal of Accounting and Economics (March 1981), 37-71.
- Dann, L.Y., and H. DeAngelo (1983), "Standstill agreements, privately negotiated stock repurchases, and the market for corporate control," Journal of Financial Economics (April 1983), 275-300.
- Deakin, E.B. (1972), "A discriminant analysis of predictors of business failure," Journal of Accounting Research (Spring 1972), 167-179.
- DeGroot, M.H. (1975), Probability and Statistics. (Addison-Wesley Publishing Co., Reading, MA).
- Dodd, P. (1980), "Merger proposals, management discretion and stockholder wealth," Journal of Financial Economics (June 1980), 105-137.

- Dodd, P., and R. Ruback (1977), "Tender offers and stockholder returns: An empirical analysis," Journal of Financial Economics (September 1977), 351-374.
- Eckbo, B.E. (1983), "Horizontal mergers, collusion, and stockholder wealth," Journal of Financial Economics 11 (April 1983), 241-274.
- Elgers, P.T. (1980), "Accounting-based risk predictions: A re-examination," Accounting Review (July 1980), 389-408.
- Ellert, J.C. (1976), "Mergers, antitrust law enforcement and stockholder returns," Journal of Finance (May 1976), 715-732.
- Fama, E.F. (1976), Foundations of Finance. (Basic Books, New York NY).
- Fama, E.F., L. Fisher, M.C. Jensen, and R. Roll (1969), "The adjustment of stock prices to new information," International Economic Review (February 1969), 1-21.
- Fama, E., and M.H. Miller (1972), The Theory of Finance. (Holt, Reinhart and Winston, New York, NY).
- Foster, George (1978), Financial Statement Analysis. (Prentice-Hall, Inc., Englewood Cliffs, NJ).
- Hite, Gailen L., and James E. Owers (1983), "Security price reactions around corporate spin-off announcements," Working Paper, The Ohio State University (July 1983).
- Holthausen, Robert W. (1981), "Theory and evidence of the effect of bond covenants and management compensation contracts on the choice of accounting techniques: The case of the depreciation switch-back," Journal of Accounting and Economics (March 1981), 73-109.
- Holthausen, Robert W., and Richard W. Leftwich (1983), "The economic consequences of accounting choice: Implications of costly contracting and monitoring," Journal of Accounting and Economics (August 1983), 77-117.
- Hong, Mai, R.S. Kaplan, and G. Mandelker (1978), "Pooling vs. purchase: The effects of accounting for mergers on stock prices," The Accounting Review (January 1978), 31-47.
- Jain, P.C. (1982), "Cross-sectional association between abnormal returns and firm specific variables," Journal of Accounting and Economics (December 1982). 205-228.
- Jensen, Michael C., and William H. Meckling (1976), "Theory of the firm: Managerial behavior, agency costs and ownership structure," Journal of Financial Economics (October 1976), 305-360.

- Jensen, M.C., and Richard S. Ruback (1983), "The market for corporate control: The scientific evidence," Journal of Financial Economics (April 1983), 5-50.
- Langetieg, T.C. (1978), "An application of a three-factor performance index to measure stockholder gains from merger," Journal of Financial Economics (December 1978), 365-384.
- Leftwich, Richard W. (1981), "Evidence of the impact of mandatory charges in accounting principles on corporate loan agreements," Journal of Accounting and Economics (March 1981), 3-36.
- Leland, Hayne E., and David H. Pyle (1977), "Informational asymmetries, financial structure, and financial intermediation," The Journal of Finance (May 1977), 371-387.
- Lev, B. (1980), "On the use of index models in analytical reviews by auditors," Journal of Accounting Research (Autumn 1980), 524-550.
- Maddala, G.S. (1977), Econometrics. (McGraw-Hill Book Company, New York, NY).
- Malatesta, Paul H. (1983), "The wealth effect of merger activity and the objective functions of merging firms," Journal of Financial Economics. (April 1983), 155-181.
- Mandelker, G. (1974), "Risk and return: Merging firms," Journal of Financial Economics (December 1974), 303-335.
- Masulis, Ronald W. (1983), "The impact of capital structure change on firm value: Some estimates," Journal of Finance (March 1983), 107-126.
- Mikkelson, Wayne H. (1983), "Capital structure changes and decreases in stockholders' wealth: A cross-sectional study of convertible security call," Working paper No. 1137, National Bureau of Economic Research (June 1983).
- Miles, James A., and James D. Rosenfeld (1983), "The effect of voluntary spin-off announcements on shareholder wealth," Journal of Finance (December 1983), 1597-1606.
- Modigliani, F. (1982), "Debt, dividend policy, taxes, inflation and market valuation," Journal of Finance (May 1982), 255-273.
- Modigliani, F., and M. Miller (1958), "The costs of capital, corporation finance, and the theory of investment," The American Economic Review (June 1958), 261-297.
- Mueller, Dennis C. (1969), "A theory of conglomerate mergers," Quarterly Journal of Economics (November 1969), 643-659.

- Myers, S.C. (1977), "Determinants of corporate borrowing," Journal of Financial Economics (November 1977), 147-176.
- Ohlson, J.A. (1980), "Financial ratios and the probabilistic prediction of bankruptcy," Journal of Accounting Research (Spring 1980), 109-131.
- Patell, J.M., and M.A. Wolfson (1979), "Anticipated information releases reflected in call option prices," Journal of Accounting and Economics (August 1979), 117-140.
- Patell, J.M., and M.A. Wolfson (1981), "The ex ante and ex post price effects of quarterly earnings announcements reflected in option and stock prices," Journal of Accounting Research (Autumn 1981), 434-458.
- Ross, S.A. (1977), "The determination of financial structure: The incentive signalling approach," Bell Journal of Economics (Spring 1977), 23-40.
- Ruback, Richard S. (1983), "Assessing competition in the market for corporate acquisitions," Journal of Financial Economics (April 1983), 141-154.
- Schipper, K., and Abbie Smith (1983), "Effects of recontracting on shareholder wealth: The case of voluntary spin-offs," Working Paper, The University of Chicago (August 1983).
- Scholes, M., and Joseph Williams (1977), "Estimating betas from nonsynchronous data," Journal of Financial Economics (December 1977), 309-328.
- Siegel, Sidney (1956), Nonparametric Statistics for the Behavioral Sciences. (McGraw-Hill Book Company, New York, NY).
- Smith, C.W., and J.B. Warner (1979), "On financial contracting: An analysis of bond covenants," Journal of Financial Economics (June 1979), 117-161.
- Snedecor, G.W., and William G. Cochran (1979), Statistical Methods, Sixth Edition. (The Iowa State University Press, Ames, IA).
- Warner, J.B. (1977), "Bankruptcy, absolute priority, and the pricing of risky debt claims," Journal of Financial Economics (September 1977), 239-276.
- Welling, Kathryn M. (1978), "Back to bread-and-butter," Barron's (January 30, 1978), 12-18.

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I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

  
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